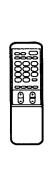
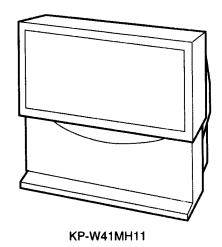
# **SERVICE MANUAL**

# RX1 chassis

MODEL	COMMANDE	R DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KP-W41MH11	FM-890	ME	SCC-J64A-A				
KP-W41MH11	RM-890	нк	SCC-J63A-A				
KP-W41MN11	RM-890	GE	SCC-J65A-A				
KP-W41SN11	RM-890	AUS	SCC-J87A-A				



RM-890







### **SPECIFICATIONS**

### **Projection system**

3 picture tubes, 3 lenses, horizontal in-

line system

**Picture tube** 

7 inch high-brightness monochrome tubes (6.3 raster size), with optical coupling and liquidcooling system

Projection lenses High performance, large-diameter

hybrid lens F1.0

Screen size **Television system** 

41 inches

B/G, I, D/K, M

**Color system** 

PAL, PAL 60, SECAM, NTSC4.43,

NTSC3.58

Channel coverage

See "Channel coverage" at the bottom

Antenna

75 ohm external antenna terminal

Audio output (Speaker)

 $15 W \times 2$ 

**Number of terminals** 

Video **Audio**  Input: 4, Output: 1 Input: 4, Output: 1

### S1 Video/S Video

Input: 4, Output: 1

Y: 1 Vp-p, 75 ohms, unbalanced, sync

negative,

C: 0.286 Vp-p, 75 ohms

**Power requirement** 

110 - 120/220 - 240 V AC, 50/60 Hz

**Power consumption** 

280 W

Dimensions (w/h/d)

 $1020 \times 1115 \times 390 \text{ mm}$ Approx. 58 kg

Mass Supplied accessories

Remote commander (1) Size R6 (AA) battery (1)

Bracket (2) Screw (2)

**Optional accessory** 

AV rack SU-W41

Design and specifications are subject to change without notice. AMERICA/CATV AMERICA

### Channel coverage

### M E/ASIA/CATV W EURO

Receivable channel	<b>Channel display</b>
E-2 to E-12	C02 to C12
E-21 to E-69	C21 to C69
S-01 to S-03	S42 to S44
S-1 to S-41	S01 to S41
Indonesia	
1A	C01
2 to 11	C03 to C12
Morocco	
M-4 to M-7	C70 to C73
M-8 to M-10	C08 to C10
New Zealand	
1	C01
2 to 11	C03 to C12
27 to 62	C27 to C62

### HK/UK

Receivable channel	<b>Channel display</b>
Hong Kong, United	Kingdom
B-21 to B-68	C21 to C68
Ireland	
A to J	C01 to C09
South Africa	
4 to 13	C04 to C13
21 to 68	C21 to C68

### **AUSTRALIA**

Receivable channel	Channel display
Australia	
AS-0 to AS-12	C00 to C12
AS-5A, AS-9A	C13, C14
AS-28 to AS-69	C28 to C69
New Zealand	
1	C00
2 to 3	C01 to C02
4 to 7	C06 to C09
8	C14
9 to 11	C10 to C12

### **CHINA/E EURO**

Receivable channel	Channel display
China	
C-1 to C-2	C01 to C02
C-3	C13
C-4	C03
C-5	C04
C-6	C14
C-7 to C-12	C06 to C11
C-13 to C-24	C21 to C32
C-25 to C-47	C38 to C60
C-48 to C-57	C61 to C70
Z-1 to Z-39	S01 to S39
Eastern Europe	
R-1 to R-12	C01 to C12
R-21 to R-60	C21 to C60

Receivable channel	Channel display
2 to 79	C02 to C79
A-1	S99
A-2	S98
A-3	S97
A-4	S96
A-5	S95
A-6	S06
A-7	S05
A-8	S01
A to W	S14 to S36
AA to CCC	S37 to S65

### **JAPAN**

Receivable channel	Channel display
J-1 to J-62	C01 to C62
C-13 to C-32	C80 to C99

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### (CAUTION)

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

### WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SER-VICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHAS-SIS

THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK & ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESECOMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFEOPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

### (ATTENTION)

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURTCIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

### ATTENTION!!

AFIN D'EVITER TOUT RISQUE DELECTROCUTION PROVENANT D'UN CHÁSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DEPANNAGE.

LE CHÁSSIS DE CE RECEPTEUR EST DIRECTEMENT RACCORDÉ Á L'ALIMENTATION SECTEUR.

### ATTENTION AUX COMPOSANTS RELATIFS ÁLA SÉCURITÉ!!

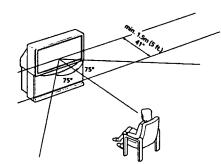
### **SECTION1 GENERAL**

The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remein as in the manual.

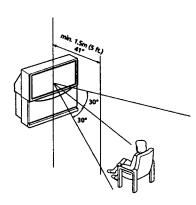
### Installing the projection TV

For the best picture quality, install the projection TV within the areas shown below.

### Optimum viewing area (Horizontal)



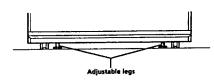
### Optimum viewing area (Vertical)



### Stabilizing the projection TV

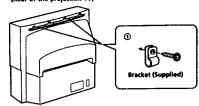
The projection TV should be installed as level as possible, for safety purposes. After setting up, adjust the two adjustable legs located at the bottom, and secure the projection TV to a wall, etc., with the supplied brackets.

1 Turn the two adjustable legs located at the bottom to the left until they touch the floor. This will stabilize the projection TV.



2 ① Mount the two supplied brackets with the screws to the upper rear side of the projection TV.

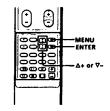
### (Rear of the projection TV)



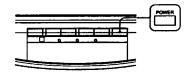
(2) Pass a strong cord or a chain through each bracket mounted in ①, and then secure to a wall or a pillar, etc.

### **Changing the menu** language

If you prefer Chinese to English, you can change the menu language. You can use the buttons on both the remote commander and the projection TV.



1 Press POWER on the projection TV.



2 Press MENU.



PVIDEO CONTROL AUDIO CONTROL TWIN PIC/PIP FEATURES PRESET LANGUAGE DEMO

3 Press  $\triangle$  + or  $\nabla$  – to move the cursor (>) to LANGUAGE.



VIDEO CONTROL AUDIO CONTROL TWIN PIC/PIP FEATURES PLANGUAGE DEMO

## 4 Press ENTER.



5 Press △ + or  $\nabla$  - to select CHINESE.



LANGUAGE⊃ ENGLISH >CHINESE/中文

6 Press ENTER.



语言 英文/ENGLISH 中文

7 Press MENU to return to the normal screen.



# Adjusting the convergence (CONVERGENCE)

Before you use the projection TV, adjust convergence. The projection tube image appears on the screen in three layers (red, green and blue). If they do not converge, the color is poor and the picture blurs. To correct this, adjust convergence.

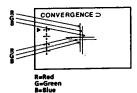
After 20-30 minutes of turning on the power, adjust convergence.

1 Press MENU.

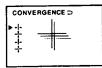
S

- 2 Press △ + or ▽ to move the cursor (►) to FEATURES and press ENTER.
- 3 Press △+ or ∇ to move the cursor (►) to CONVERGENCE and press ENTER.

The CONVERGENCE adjustment screen appears.

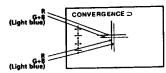


4 Press △+ or ▽ - to move the cursor (►) to the symbol showing the line you want to adjust, and press ENTER.



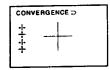
- -1-: Red vertical line (left/right adjustment)
- +: Red horizontal line (up/down adjustment)
- -i-: Blue vertical line (left/right adjustment)
- +: Blue horizontal line (up/down adjustment)

5 Press △ + or ∇ - to move the line until it converges with the center green line, and press ENTER.



To move up/right, press  $\Delta$  +. To move down/left, press  $\nabla$  -.

6 Repeat step 4 and 5 to adjust the other lines until all three lines converge and are seen as a white cross.



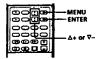
7 Press MENU to return to the normal screen.

### **Presetting channels**

You can preset TV channels easily by storing all the receivable channels automatically. You can also preset channels manually or skip program positions (page 23). You can preset channels using the buttons on the projection TV as well as those on the remote commander.

### Presetting channels automatically

You can preset up to 100 TV channels in numerical sequence from program position 1.



1 Press MENU.



PVIDEO CONTROL
AUDIO CONTROL
TWIN PIC/PIP
FEATURES
PRESET
LANGUAGE
DEMO

2 Press △ + or ∇ - to move the cursor (►) to PRESET.



VIDEO CONTROL
AUDIO CONTROL
TWIN PIC/PIP
FEATURES
PRESET
LANGUAGE
DEMO

3 Press ENTER.



PRESET⊃ DAUTO PROGR MANUAL PROGR 4 Press △ + or  $\nabla$  - to select AUTO PROGR.



PRESET D FAUTO PROGR MANUAL PROGR

5 Press ENTER.



AUTO PROGRED

M E/ASIA/CATY W EURO
AUSTRALIA
HK/UK
CHINA/E EURO
AMERICA/CATY AMERICA
JAPAN

6 Press △ + or ▽ – to select your area (channel system).

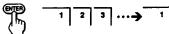
For the areas allocated in each channel system, see "Channel allocation" on page 28.



AUTO PROGR D
M E/ASIA/CATY W EURO
AUSTRALIA
HK/UK
CHINA/E EURO
AMERICA/CATY AMERICA
JAPAN

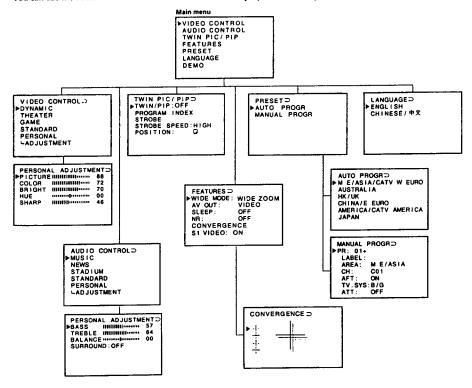
7 Press ENTER.

Presetting starts from program 1.



### Introducing the menu

You can preset channels and set the wide mode, picture quality, sound, and other settings using the on-screen menus. You can use the buttons on both remote commander and the projection TV to operate the menus.



### Getting back to the previous menu

Press  $\triangle$  + or  $\nabla$  - to move the cursor (>) to the first line (그) of each menu (except for the main menu), and press ENTER.

### Cancelling the menu screen

### Press MENU.

- . If more than 60 seconds elapse after you press a button, the menu screen disappears automatically.

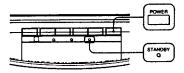
  DEMO in the main menu briefly introduces the main features
- available for the projection TV. Press any button on the remote commander to stop this function.

### Watching the TV

### 1 Select the TV program you want to watch.

Press the number buttons or PROGR +/-. The projection TV turns on automatically and the selected program appears.

When the STANDBY indicator on the front of the projection TV is not lit, press POWER on the projection TV, and select the program position.



### To select a program position directly

Press the number buttons.



To select a two-digit program position, press "-/--" before the number buttons.

For example, to select program position 25, press "-i--" and then "2" and "5."



### To scan through program positions

Press PROGR +/- until the program position you want appears.



### To select a channel directly

Press C (once for VHF/UHF channels, twice for cable TV channels), then press the number buttons (two-digit number for VHF/UHF channels, threedigit number for cable TV channels). For example, to select the VHF/UHF channel 4, press C, 0 then 4.

### 2 Press VOL +/- to adjust the volume.



### Switching off the projection TV

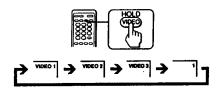
To switch off the projection TV temporarily, press POWER on the remote commander. The STANDBY indicator lights.



To switch off the projection TV completely, press POWER on the TV.

### Watching the video input

Press VIDEO/HOLD.

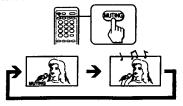


To watch projection TV, press TV, the number buttons or PROGR +/-.



### Muting the sound

Press MUTING.

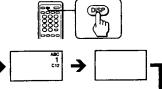


Operations | 11-EN

9

### Displaying on-screen information





### Note

 When you press DISP, the on-screen display shows the picture, sound and wide mode settings as well, all of which disappear after three seconds.

### Freezing the Picture

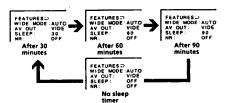
#### Press FREEZE.

The screen will become TWIN PICTURE, and the freezed picture will appear on the right screen.

### **Setting the Sleep Timer**

You can set the projection TV to turn off automatically after the period of time you set.

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to FEATURES, and press ENTER.
- 3 Press △ + or ▽ to move the cursor (►) to SLEEP, and press ENTER.
- 4 Press △ + or ∇ until the time (in minutes) you want appears.



#### 5 Press ENTER.

To cancel the Sleep Timer, select OFF, or turn the projection TV off.

12-EN | Operations

# Watching the picture in wide mode

You can enjoy a variety of wide-mode pictures. The projection TV's WIDE MODE factory preset is WIDE ZOOM. The WIDE MODE is retained in the memory after the power is turned off. You can also manually set the WIDE MODE in the FEATURES menu.

### Using the AUTO WIDE function

When you set the TV picture mode on AUTO WIDE, the projection TV will automatically choose the wide picture mode (WIDE ZOOM/ZOOM/SUBTITLE) that is most suitable for the program you are watching.

### Press AUTO WIDE.



#### **Notes on AUTO WIDE**

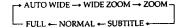
- Depending on the picture sources, the AUTO WIDE function may not stick to one mode. It may differ. In this case, select your desired wide mode using the WIDE button.
- The AUTO WIDE function is not available for SECAM color system.

### **Using the WIDE function**

You can preview all wide-mode pictures and set the desired mode by pressing the WIDE button on your remote commander.

Press WIDE until the mode you want appears on the screen.





#### WIDE ZOOM

This mode is ideal when viewing a movie or sports programs.

### Conventional picture (NORMAL mode)



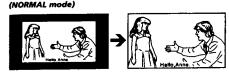
**WIDE ZOOM** 

### ZOOM

This mode is best for viewing a movie with black bands or subtitles

### Conventional picture





### SUBTITLE

This mode is most suitable when watching movies with subtitles.

### Conventional picture (NORMAL mode)



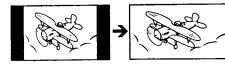


### Viewing a picture in FULL mode

When you are watching a video game screen with dynamic effect or watching an S1 Video picture, use FULL mode.

### Conventional picture (NORMAL mode)





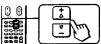
### Scrolling the picture up or down

If subtitles are lost in subtitle mode, you can scroll the picture up or down to view them. The picture scrolls up or down within the range of -5 to +5. You can also use the scroll function in widezoom and zoom modes. Using the scroll function in widezoom mode changes the vertical size of the picture.

### 1 Press SCROLL.



2 Press ∆ + or ∇ - to adjust the position of the picture.



#### Note

 If you display the PIP screen in zoom mode or scroll the picture with the PIP screen in zoom mode or subtitle mode, the PIP screen may be lost. However, this does not indicate a malfunction.

### Selecting the desired WIDE MODE from the menu

When AUTO WIDE is set, the projection TV automatically picks the best mode. You can use the FEATURES menu to select another mode.

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to FEATURES, and press ENTER.

FEATURES D

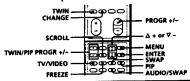
WIDE MODE: WIDE ZOOM
AV OUT: VIDEO
SLEEP: OFF
NR: OFF
CONVERGENCE
S1 VIDEO: ON

- 3 Press △ + or ∇ to move the cursor (►) to WIDE MODE, and press ENTER.
- 4 Press ∆ + or ∇ to select the desired mode, and press ENTER.

To see the different wide picture modes, refer to page 12 and 13.

### Watching two programs at one time-TWIN PICTURE and PIP

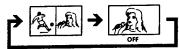
You can display a left and right TWIN PICTURE screens or display a Picture-in-Picture (PIP) sub screen within the main picture.



### **Displaying TWIN PICTURE**

You can display two screen pictures side by side using the TWIN/PIP menu and/or the TWIN button on the remote commander.

### Press TWIN.



### Selecting a TV program or video input in the right TWIN PICTURE screen

To select a TV program, press TWIN/PIP PROGR +/-

To select a video input, press TV/VIDEO.

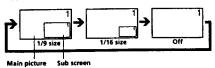
#### Notes

- You cannot select the same channel on the right and left
- When a fast-moving picture is displayed in the right TWIN PICTURE screen, the picture may look unnatural. This is not a malfunction. To correct, press CHANGE to switch the right and left TWIN PICTURE screens.

### Displaying PIP

You can display PIP by using the TWIN/PIP menu and/or the PIP button on the remote commander.

#### Press PIP.



### Selecting a TV program or video input in the PIP screen

To select a TV program, press TWIN/PIP PROGR +/-

To select a video input, press TV/VIDEO.

### Freezing TWIN PICTURE and the PIP screen

#### Press FREEZE.

The PIP sub screen or right TWIN PICTURE screen will

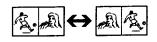




To restore the normal picture, press FREEZE again.

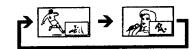
### Changing the left and right TWIN **PICTURE screens**

Press CHANGE



### Swapping pictures between the main and PIP screens

Press SWAP.



### Swapping the sound between TWIN PICTURE's right and left screens or PIP's main and sub screens

Press AUDIO SWAP.

The "" display will appear indicating which TWIN PICTURE's sound is being received.

### Changing the position of the PIP screen

1 Press MENU.

PVIDEO CONTROL AUDIO CONTROL TWIN PIC/PIP FEATURES LANGUAGE DEMO

2 Press △ + or ▽ - to move the cursor (►) to TWIN PIC/PIP, and press ENTER.

> TWIN PIC/PIPD PROGRAM INDEX STROBE STROBE SPEED:HIGH POSITION: Q

- 3 Press  $\triangle$  + or  $\nabla$  to move the cursor ( $\triangleright$ ) to POSITION, and press ENTER.
- **4** Press  $\triangle$  + or  $\nabla$  to select the position you

Pressing  $\Delta$  + changes the position as shown below. Pressing ∇ - changes the position in reverse order.



### Selecting TWIN PICTURE or PIP from the menu

Follow these directions to select PIP and TWIN PICTURE from the TWIN PIC/PIP menu.

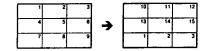
- 1 Press MENU.
- 2 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to TWIN PIC/PIP, and press ENTER.
- 3 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to TWIN/PIP, and press ENTER.
- 4 Press △ + or ▽ to select TWIN, PIP 1 or PIP 2, and press ENTER.

To view a sample of the TWIN PICTURE and PIP screens, see "Displaying PIP" and "Displaying TWIN PICTURE" sections.

### Checking all the preset programs (Program Index)

#### Press INDEX.

The nine preset programs appear in the separated screen in sequence, switching the picture for each second. The sound is muted. Then next nine sequential programs appear. After all the preset programs are displayed, the programs switch the picture with the sound for each five seconds. Pressing PROGR + also switches to the next nine programs.



#### To restore the normal picture

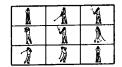
Press the number buttons which you want to watch (e.g., for program 25, press -/--, 2 and 5). Pressing INDEX also restores the normal picture.

#### Notes

- · You can also display nine sequential TV programs using the menu. Select PROGRAM INDEX from the TWIN PIC/PIP menu, then press ENTER.
- · If you display different TV systems in the Program Index screen, the size of the separated screens may be different.
- . You can not use TWIN PICTURE while PROGRAM INDEX is selected.

### Displaying frame-by-frame pictures (Strobe)

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to TWIN PIC/PIP, and press ENTER.
- 3 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to STROBE, and press ENTER.



### To select the strobe speed

Select STROBE SPEED from the TWIN PIC/PIP menu, and press ENTER. Then select HIGH (3 seconds), MIDDLE (7 seconds) or LOW (12 seconds) with  $\Delta$  + or ∇ -, and press ENTER.

### To restore the normal picture

Select STROBE from the TWIN PIC/PIP menu again, and press ENTER.

You can also restore the normal picture with TV, VIDEO, PROGR +/-, POWER or Wide mode buttons.

9

- · You can hear the normal sound when using the strobe feature.
- You can not watch TWIN PICTURE when STROBE is selected.

#### Notes on TWIN PICTURE features

- · If you display different color systems in the right and left screens, the size of screen may be different.
- The sound from the right screen is monaural.

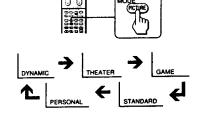
### Notes on PIP features

- · When you display a VCR picture in the PIP screen at a speed other than normal speed, the picture may be noisy depending on the VCR. The picture can be improved by selecting the smaller size of the PIP screen.
- · If you display different color systems in the main screen and the PIP screen, the size of the PIP screen may be different and the PIP picture may be noisy. This is not caused by the malfunction of the TV.

### Selecting the picture mode

You can select the picture mode using the menu as well as the PICTURE MODE button on the remote commander. Select VIDEO CONTROL from the main menu, then select the desired mode.

### Press PICTURE MODE until the mode you want appears on the screen.



Select	То
DYNAMIC	Display more contrast picture
THEATER	Display darker and finely detailed picture suitable for movies
GAME	Display softer picture suitable for the video games
STANDARD	Display normal contrast picture
PERSONAL	Display the picture that is adjusted using ADJUSTMENT in the VIDEO CONTROL menu

### Viewing a video game screen

### Press PICTURE MODE until the GAME mode appears on the screen.

The screen changes to the optimum mode for video games with soft picture. The WIDE MODE is automatically set on FULL mode.

### If the fixed (non-moving) pattern is on the screen for long periods of time

Keep the picture functions at low settings (see "Adjusting the picture setting" on page 17). If not, the image may be permanently imprinted on the screen.

#### Note

. To prevent imprints on the screen, the picture shifts horizontally about 5 mm every 30 minutes in the GAME mode. This is not a malfunction of the TV.

### Adjusting the picture setting (ADJUSTMENT)

You can adjust the picture quality to suit your taste with the ADJUSTMENT option. The adjusted settings are stored in the PERSONAL option.



1 Press MENU.

VIDEO CONTROL AUDIO CONTROL TWIN PIC/PIP LANGUAGE

2 Press △ + or ▽ - to move the cursor (▶) to VIDEO CONTROL, and press ENTER.

> VIDEO CONTROLD DYNAMIC THEATER GAME STANDARD PERSONAL -ADJUSTMENT

3 Press  $\triangle$  + or  $\nabla$  - to move the cursor (>) to ADJUSTMENT, and press ENTER.

PERSON	AL ADJUSTM	
	161161111111111	68
COLOR	6010011H001H19++++	72
BRIGHT	\$\$\$\$£\$136\$\$\$ <b>\$</b> \$******	70
HUE	*********	00
SHARP	\$P\$\$114\$\$********	46
•		

- 4 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to the item you want to adjust, and press
- 5 Press  $\triangle$  + or  $\nabla$  to adjust the item, and press ENTER.

Item	Press △ + to	Press ∇ - to
PICTURE	Increase picture contrast	Decrease picture contrast
COLOR	Increase color intensity	Decrease color intensity
BRIGHT	Brighten the picture	Darken the picture
HUE	Make skin tones become greenish	Make skin tones become reddish
SHARP	Sharpen the picture	Soften the picture

- 6 To adjust other items, repeat steps 4 and 5.
- 7 Press MENU to return to the normal screen.

You can adjust HUE for NTSC color system only.

### Reducing the noise of the picture (NR)

You can reduce the noise level of the picture when the TV receives a weak signal or when you play a video tape that is in poor condition.

- 1 Press MENU.
- 2 Press △ + or ▽ to select FEATURES, and press ENTER.

- 3 Press  $\triangle$  + or  $\nabla$  to select NR, and press
- 4 Press  $\triangle$  + or  $\nabla$  to select ON, and press

To turn the noise reduction off, select OFF and press ENTER.

### If the color of the picture is abnormal when receiving programs through the 🏋 (antenna) terminal

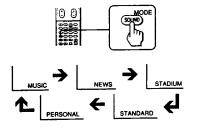
Press COLOR SYSTEM on the projection TV or change the TV system setting from the menu as described below until the color becomes normal.

- 1 Press MENU.
- 2 Press △ + or ∇ to move the cursor (▶) to PRESET, and press ENTER.
- 3 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to MANUAL PROGR, and press ENTER.
- 4 Press △ + or ▽ to move the cursor (▶) to TV SYS, and press ENTER.
- 5 Press △ + or ∇ to change the TV system until the color becomes normal.

. Normally set COLOR SYSTEM to AUTO.

You can select the sound mode using the menu as well as the SOUND MODE button on the remote commander. Select AUDIO CONTROL from the main menu, then select the desired mode.

Press SOUND MODE until the mode you want appears on the screen.



Select	To
MUSIC	Listen to music programs. It gives sound with a live concert effect.
NEWS	Listen to news program. A person's voice can be heard clearly.
STADIUM	Listen to sports program. It gives sound with a sports stadium effect.
STANDARD	Listen to sound other than music, news or sports program.
PERSONAL	Listen to the sound that is adjusted using ADJUSTMENT in the AUDIO CONTROL menu.

### Adjusting the sound setting (ADJUSTMENT)

You can adjust the sound quality to suit your taste with the ADJUSTMENT option. The adjusted settings are stored in the PERSONAL option.



1 Press MENU.

PVIDEO CONTROL AUDIO CONTROL TWIN PIC/PIP FEATURES PRESET LANGUAGE DEMO

2 Press △ + or ∇ - to move the cursor (►) to AUDIO CONTROL, and press ENTER.

AUDIO CONTROLD

MUSIC

NEWS

STADIUM

STANDARD

PERSONAL

LADJUSTMENT

3 Press △ + or ∇ – to move the cursor (►) to ADJUSTMENT, and press ENTER.

<b>▶BASS</b>	MTSULGA JA	57
	10001  11   10	64
	E	00
	ND: OFF	

- 4 Press △ + or ▽ to move the cursor (►) to the item you want to adjust, and press ENTER.
- 5 Press △ + or ∇ to adjust the item, and press ENTER.

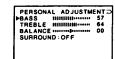
Item	Press ∆ + to	Press ∇ – to
BASS	Increase the bass sound	Decrease the bass sound
TREBLE	Increase the treble sound	Decrease the treble sound
BALANCE	Increase the volume of right speaker	Increase the volume of left speaker

- 6 To adjust other items, repeat steps 4 and 5.
- 7 Press MENU to return to the normal screen.

### Listening to surround sound

You can enjoy a surround sound effect that is like being in a movie theater or a concert hall when receiving stereo signals.

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to AUDIO CONTROL, and press ENTER.
- 3 Press △ + or ∇ to move the cursor (►) to ADJUSTMENT, and press ENTER.



- 4 Press △ + or ∇ to move the cursor (►) to SURROUND, and press ENTER.
- 5 Press  $\triangle$  + or  $\nabla$  to select ON, and press ENTER.

# If the sound is distorted or noisy when receiving programs through the $\ensuremath{\mathbb{T}}$ (antenna) terminal

Press COLOR SYSTEM on the projection TV or change the TV system setting as follows until the sound becomes clear.

- 1 Press MENU.
- 2 Press △ + or ∇ to move the cursor (►) to PRESET, and press ENTER.
- 3 Press △ + or ∇ to move the cursor (►) to MANUAL PROGR, and press ENTER.
- 4 Press △ + or ∇ to move the cursor (►) to TV SYS, and press ENTER.
- 5 Press  $\triangle$  + or  $\nabla$  to change the TV system until the sound becomes clear.

#### Note

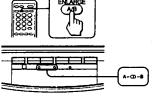
 $\bullet\,$  Normally set COLOR SYSTEM to AUTO.

# Selecting a stereo or bilingual program

You can enjoy stereo sound or bilingual program of NICAM and A2 (German) stereo systems. The initial setting is stereo sound.

### Press A/B/ENLARGE repeatedly until you receive the sound you want.

The sound changes and the corresponding indicator lights up as follows:



When receiving a NICAM program:

Broadcasting	On-screen Display	Selected sound (Indicator lit)
NICAM stereo	NICAM	→ Stereo → Regular- (A and B)
NICAM bilingual	NICAM	
NICAM monaural	NICAM	NICAM monaural (A) Regular←

When receiving an A2 (German) stereo program:

Broadcasting	On-screen display	Selected sound (Indicator lit)  → Stereo → Monaural- (A and B)	
A2 (German) stereo	STEREO		
A2 (German) bilingual	<del>-</del>	A → B — (A) (B)	

### Receiving area for NICAM and A2 (German) stereo programs

System Receiving area			
NICAM	Hong Kong, Singapore, New Zealand, etc.		
A2 (German) stereo	Australia, Malaysia, Thailand, etc.		

#### lotes

- If the signal is very weak, the sound becomes monaural.
- If the stereo sound is noisy, select "regular" or "mono."

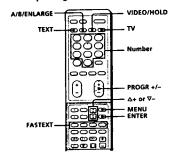
  The sound becomes monaural, however, the noise will be reduced.

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# Viewing Teletext

TV stations broadcast an information service called Teletext via a local TV channel.

Teletext service allows you to receive various information such as weather forecasts or news at any time. Some of the features, however, may not be available depending on the Teletext service.



### **Displaying Teletext**

- 1 Select a TV channel which carries the Teletext broadcast you want to watch.
- 2 Press TEXT to display the Teletext.

  A Teletext page (normally the index page) is

A Teletext page (normally the index page) is displayed on the left. If there is no Teletext broadcast, P100 appears in the top left corner of the screen.

To switch Teletext off, press TV.

## Superimposing a Teletext page on the TV picture

### Press TEXT.

Each time you press TEXT, the screen changes as follows:

→ Teletext → Teletext and TV → TV —

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### Checking the contents of a Teletext service (INDEX)

When Teletext is switched on, you can display the Teletext menu.

1 Press MENU.

FINDEX
TEXT CLEAR
SUBTITLES
REVEAL :OFF
TIME PAGE
SUBPAGE

2 Press △ + or ▽ - to move the cursor (►) to INDEX, and press ENTER.

### Selecting a Teletext page

Press the number buttons to enter the threedigit page number of the Teletext number you want.

If you make a mistake, re-enter the correct page number.

To access the next or previous page, press PROGR +/-.

#### Note

 When you request another Teletext page while viewing one Teletext page, the page scrolling may pause on a different page depending on the Teletext service, but the search will continue till the requested page is displayed.

## Preventing a Teletext page from being updated (HOLD)

A Teletext page may consist of several subpages. You can stop the page scrolling in order to read the text at your own pace.

#### Press VIDEO/HOLD.

HOLD appears in the top left corner of the screen.

To resume normal Teletext operation, press

### **Using FASTEXT**

This feature allows you to quickly access a Teletext page that uses FASTEXT. When a FASTEXT page is broadcast, a color-coded menu appears at the bottom of the screen. The colors of the menu correspond to the red (TV/VIDEO), green (FREEZE), yellow (SWAP) and blue (PIP) buttons on the remote commander. These colored buttons function as the FASTEXT buttons in Teletext mode.

### Press the colored button which corresponds to the color-coded menu.

The page is displayed after a few seconds.

### Enlarging the Teletext display (ENLARGE)

Each time you press A/B/ENLARGE, the Teletext display changes as follows:

→Enlarge upper half→Enlarge lower half→Normal size-

### Revealing concealed information (REVEAL)

Sometimes pages contain concealed information, such as answers to a quiz. The reveal option discloses the information.

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to REVEAL, and press ENTER.
- 3 Press △ + or ∇ to select ON, and press FMTER.

To conceal the information again, select OFF.

### Watching a TV program while waiting for a requested Teletext page (TEXT CLEAR)

- 1 Select the Teletext page to which you want to refer.
- 2 Press MENU.
- 3 Press △ + or ∇ to move the cursor (►) to TEXT CLEAR, and press ENTER.
- 4 When the page number is displayed on the screen, press TEXT to switch the Teletext on.

To restore the normal Teletext reception, press TEXT.

### Displaying subtitles (SUBTITLES)

Your Teletext service informs you if a TV program is subtitled.

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to SUBTITLES, and press ENTER.

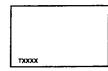
#### Note

 If the subtitles are not broadcast on page 888, select the subtitle page using the number buttons.

### Displaying a Teletext page at the requested time (TIME PAGE)

You can display a time-coded page (e.g. an alarm page) at the time you preset.

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to TIME PAGE, and press ENTER.
- 3 Press the number buttons to enter four digits for the desired time. For example, to enter 7:30, press 0,7,3 and 0.



At the requested time, the page appears on the screen.

To restore the normal Teletext reception, press TEXT.

## Displaying a particular page among several subpages (SUBPAGE)

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (►) to SUBPAGE, and press ENTER.
- 3 Press the number buttons or PROGR +/- to enter four digits for the desired subpage. For example, to display the second page of a sequence, press 0, 0, 0 and 2.

SXXXX		

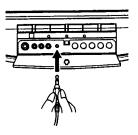
### **Using headphones**

You can use headphones to enjoy the sound of the TV. This feature also allows you to enjoy the sound of PIP and TWIN PICTURE screens.

### Listening to the sound of the projection TV with headphones

Insert the headphones into the  $\Omega$  (headphones) jack located on the front panel of the projection TV.

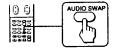
The sound from the speaker is shut off. To adjust the headphones volume, press VOL +/-.



### Setting the output of your headphones

When using TWIN PICTURE and PIP, you will have to select the output of your headphones. For example, with TWIN PICTURE, you can select right and left picture sound. Whereas with PIP, you can select main or sub picture sound.

#### Press AUDIO SWAP.



### **Customizing the** projection TV

### Using the AV OUT (advance rec-out) terminal

You can select the output signal from the VIDEO jacks at the rear of the projection TV.

The S Video output can be used only when VIDEO is selected. However, it cannot be used in Program Index or Strobe mode even though VIDEO is selected.

- 1 Press MENU.
- **2** Press  $\triangle$  + or  $\nabla$  to select FEATURES, and press ENTER.

FEATURES > WIDE MODE: WIDE ZOOM AV OUT: VIDEO SLEEP: OFF NR: OFF

- 3 Press △ + or ▽ to select AV OUT, and press
- 4 Press  $\triangle$  + or  $\nabla$  to select the output signal, and press ENTER.

Select	To
TV	Output the TV signal.
VIDEO	Output the signal of the picture you are watching as a main picture. (For TWIN PICTURE, a left picture will be output.)

### Selecting a TV program output from VIDEO/TV OUT iacks while using the PIP feature

When watching a  $T\bar{V}$  program in the main screen, use PROGR

. Do not change the channel or use AUDIO SWAP while recording with a VCR through the VIDEO/TV OUT jacks. If you change the channel, it also changes the channel you are recording.

### Presetting channels manually

To change the program position for a channel or to receive a channel with a weak signal, preset the channel manually.

For example, preset a channel in program position 8.

- 1 Press MENU.
- 2 Press △ + or ▽ to move the cursor (▶) to PRESET, and press ENTER.

PRESET D MANUAL PROGR

3 Press △ + or ∀ - to select MANUAL PROGR, and press ENTER.

> MANUAL PROGROPER: 01+ AREA: M E/ASIA CH: CO1 ATT: OFF

- 4 Select the program position to which you want to preset a channel.
  - (1) Press △ + or  $\nabla$  to select PR, and press ENTER.
  - (2) Press ∆ + or ∇ to select 8. You can also select the program position with PROGR +/- or the number buttons (e.g., for program 24, press -/--, 2 and 4).
  - (3) Press ENTER.
- 5 Select your area (channel system).

For the areas allocated in each channel system, see "Channel allocation" on page 28.

- (1) Press △ + or ∇ to select AREA, and press
- (2) Press ∆ + or ∇ to select your area, and press
- 6 Select a channel which you want to preset.
  - (1) Press  $\Delta$  + or  $\nabla$  to select CH, and press ENTER. (2) Press ∆ + or ∇ - until the channel you want
  - appears on the screen. You can also select the channel directly using the number buttons. Press C (once for VHF/ UHF channels, twice for cable TV channels), then the number buttons (e.g., for channel 5, press 0 and 5).
  - (3) Press ENTER.

### To preset other channels

Repeat steps 4 to 6.

### **Disabling program positions**

By disabling unused or unwanted program positions, you can skip those positions when you press PROGR

For example, disable program position 8.

- 1 Display the MANUAL PROGR menu. (Follow steps 1 to 3 in "Presetting channels manually" on this page.)
- **2** Press  $\triangle$  + or  $\nabla$  to move the cursor ( $\triangleright$ ) to PR. and press ENTER.
- 3 Press PROGR + or until 8 appears.
- 4 Press △ + or ▽ to select "-", and press

To skip other program positions, repeat steps 3 and

To restore the skipped program positions In step 4 above, press  $\Delta$  + or  $\nabla$  - to select "+," and press ENTER.

- 1 Display the MANUAL PROGR menu. (Follow steps 1 to 3 in "Presetting channels manually" on this page.)
- 2 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to PR, and press ENTER.
- 3 Press  $\triangle$  + or  $\nabla$  to select the program position you want to caption and press ENTER.
- 4 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to LABEL, and press ENTER.
- 5 Press  $\triangle$  + or  $\nabla$  to select a letter or number, and press ENTER for each caption space (up to five.)

Each time you press  $\Delta$  + or  $\nabla$  -, the letter (number) changes as shown below.

 $A \rightarrow B \rightarrow ... \rightarrow Z \rightarrow 0 \rightarrow 1 \rightarrow ... \rightarrow 9 \rightarrow - \rightarrow : \rightarrow / \rightarrow . \rightarrow$ +---\_\_ (space)

For the caption space you want to leave blank, select "-."

6 Repeat steps 2 to 5 to caption other channels.

### To erase a caption

In step 5 above, select "\_ (space)."

### Manual fine-tuning

Normally, the automatic fine-tuning (AFT) is operating. However, if the picture of a channel is distorted, you can use the manual fine-tuning function for the channel to obtain better picture reception.

- 1 Display the MANUAL PROGR menu. (Follow steps 1 to 3 in "Presetting channels manually" on page 23.)
- 2 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to PR, and press ENTER.
- **3** Press  $\triangle$  + or  $\nabla$  to select the program position corresponding to the channel which you want to manually fine-tune, and press ENTER.
- 4 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to AFT, and press ENTER.
- 5 Press △ + or ▽ to select OFF, and press
- 6 Press  $\triangle$  + or  $\nabla$  to fine-tune the channel so that you get the best TV reception. As you press these buttons, the frequency changes from -128 to +128.
- 7 After fine-tuning, press ENTER. The fine-tuned level is stored.

### Improving TV signal

If the reception signal is very strong, you can attenuate it to obtain better picture reception.

- 1 Display the MANUAL PROGR menu. (Follow steps 1 to 3 in "Presetting channels manually" on page 23.)
- **2** Press  $\triangle$  + or  $\nabla$  to move the cursor ( $\triangleright$ ) to PR, and press ENTER.
- 3 Press △ + or ▽ to select the program position corresponding to the channel whose signal is very strong, and press
- 4 Press △ + or  $\nabla$  to move the cursor (>) to ATT, and press ENTER.
- 5 Press △ + or ∇ to select ON, and press

### **Setting S1 Video**

The default setting for S1 Video in the Features menu is ON. If an S1 Video signal is received, the projection TV will automatically display the screen in FULL mode. You can turn this function off by setting S1 VIDEO to OFF.

- 1 Press MENU.
- 2 Press  $\triangle$  + or  $\nabla$  to move the cursor (>) to FEATURES, and press ENTER.

FEATURES D

WIDE MODE: WIDE ZOOM

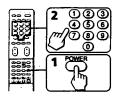
AV OUT: VIDEO

TEEP: OFF CONVERGENCE S1 VIDEO: ON

- 3 Press △ + or ▽ to move the cursor (>) to S1 VIDEO, and press ENTER.
- 4 Press △ + or ▽ to select ON or OFF, and press ENTER.

### **Setting the remote** command mode

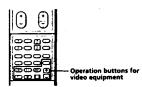
You can use the supplied remote commander to operate the TV and Sony video equipment, such as a VCR or multi-disc player. To operate Sony video equipment, first set the remote command mode for the video equipment you want to use.



- 1 Press and hold the POWER button in the VCR control area.
- 2 Press the number buttons that correspond to the remote command mode.

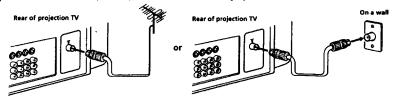
Mode number buttons	Remote command mode	
0 and then 1	VTR1 (e.g., Beta format VCR)	
0 and then 2	VTR2 (e.g., 8 mm format VCR)	
0 and then 3	VTR3 (e.g., VHS format VCR)	
0 and then 4	MDP (multi-disc player)	

After setting the remote command mode, you can use the following buttons to operate the video equipment.



### Connecting a VHF antenna or a combination VHF/UHF antenna-75-ohm coaxial cable (round)

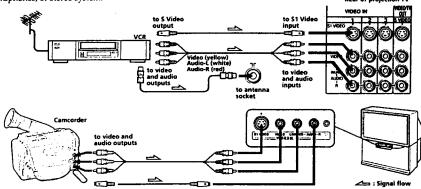
Attach an optional IEC antenna connector to the 75-ohm coaxial cable. Plug the connector into the T (antenna) terminal at the rear of the projection TV.



### **Connecting optional equipment**

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You can connect optional audio/video equipment to this projection TV such as a VCR, multi-disc player, camcorder, headphones, or stereo system.



#### When connecting a monaural VCR

Connect the yellow plug to VIDEO and the white plug to AUDIO-L (mono).

### Note on the S1 Video signal

When the S1 Video signal is input through the VIDEO 1/2/3 IN jack, set WIDE MODE to OFF if you do not want to display the picture in full wide mode (see page 13).

to 5 Video output

### **Additional Information**

### If both S Video and video signals are input

The S Video input signal is selected. To view a video signal, disconnect the 5 Video connection.

### Note on the video input

When no signal is input, the screen becomes black and on-screendisplay becomes dark.

### When connecting a VCR to the VIDEO 3 IN jacks

This projection TV is equipped with two sets of the VIDEO 3 IN jacks on the front and rear panels. Front and rear jacks are not available to be used at the same time. When using equipment connected, turn off other equipment not in use.

### **Channel allocation**

### Areas allocated in each channel system

#### M E/ASIA/CATV W EURO

Afghanistan, Albania, Algeria, Austria, Bahrain, Bangladesh, Belgium, Brunei, Canary Islands, Cyprus, Denmark, Egypt, Finland, Germany, Ghana, Gibraltar, Greece, Iceland, India, Indonesia, Iran, Iraq, Italy, Jordan, Kenya, Republic of Korea, Kuwait, Lebanon, Liberia, Libya, Luxemburg, Malaysia, Malta, Mauritania, Mauritius, Maldives Rep., Morocco, Mozambique, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Portugal, Qatar, Sarawak, Saudi Arabia, Seychelles, Sierra Leone, Singapore, Spain, Srilanka, Sudan, Swaziland, Sweden, Switzerland, Syrian Arab Rep., Tanzania, Thailand, Tunisia, Turkey, Uganda, United Arab Emirates, Western Sahara, Yemen Arab Republic, People's Dem. Rep. of Yemen, Yugoslavia, Zambia, Zimbabwe

### **AUSTRALIA**

Australia, New Zealand

Hong kong, Ireland, Lesotho, South Africa, United Kingdom

#### CHINA/E EURO

Benin, Bulgaria, China, Congo, Czechoslovakia, Djibouti Republic, Gabon, Guadeloupe, Guiana, Guinea (P.P.R.), Hungary, Ivory Coast, Dem. People's Rep. of Korea, Madagascar, Mongolia, New Caledonia, Niger, Poland, Reunion, Rumania, Senegal, Tahiti, Togo, Former U.S.S.R., Vietnam, Zaire

#### AMERICA/CATV AMERICA

Bahama Islands, Barbados, Belize, Bermuda, Bolivia, Burma (UHF), Canada, Chile, Colombia, Costa Rica, Cuba, Dominica Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Hawaii, Honduras, Jamaica, Laos, Mexico, Panama, Peru, Philippines, Puerto Rico, Surinam, Taiwan, Trinidad & Tobago, U.S.A., U.S.A. (CATV), Venezuela

Burma (Myanmar) (VHF), Japan (VHF, UHF)

### TV and color systems of each channel system

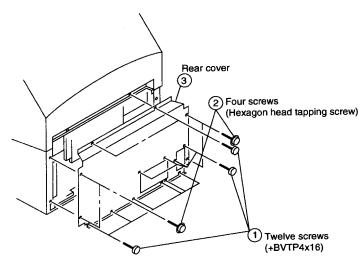
The TV system and color system are automatically set according to the channel system.

Channel system	TV system	Color system
M E/ASIA/ CATV W EURO	B/G, H: West European TV standard	AUTO
AUSTRALIA	B/G, H: Australian TV standard	AUTO
HK/UK	I: British TV standard	AUTO
CHINA/E EURO	D/K: East European TV standard	AUTO
AMERICA/CATV AMERICA	M: American TV standard	AUTO
JAPAN	M: Japan TV standard	AUTO

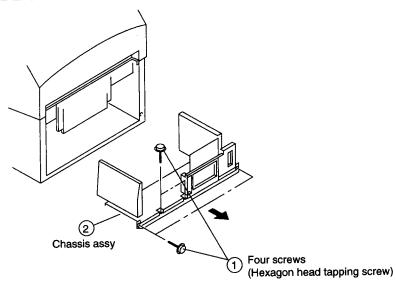
### **Additional Information**

# SECTION 2 DISASSEMBLY

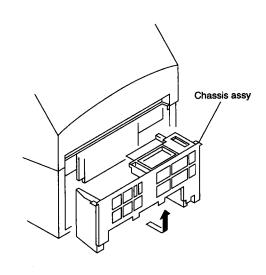
### 2-1. REAR COVER REMOVAL



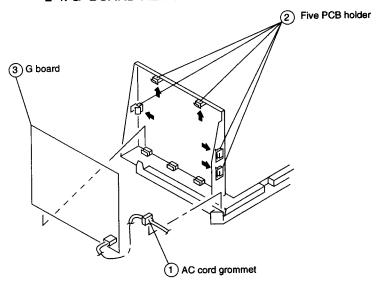
### 2-2. CHASSIS ASSY REMOVAL

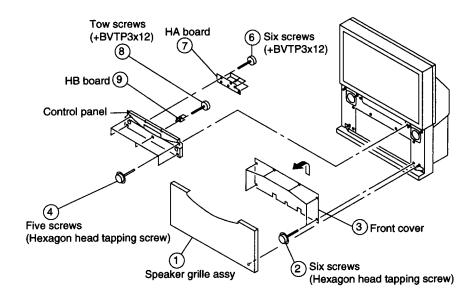


### 2-3. SERVICE POSITION

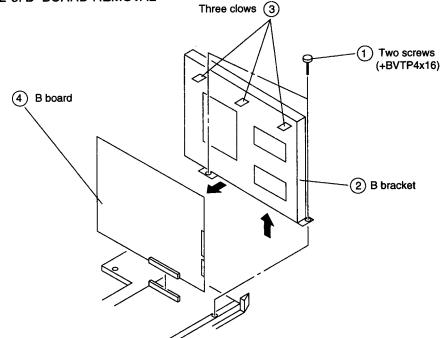


2-4. G BOARD REMOVAL

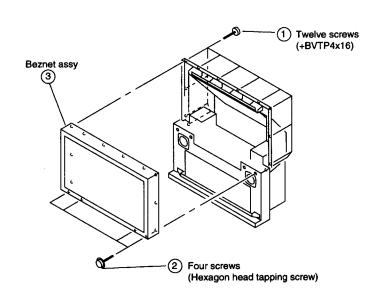




### 2-6. B BOARD REMOVAL

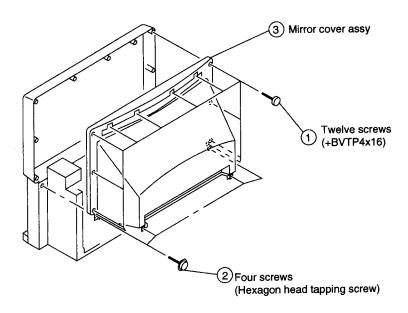


### 2-8. BEZNET ASSY REMOVAL

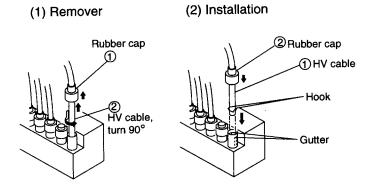


0

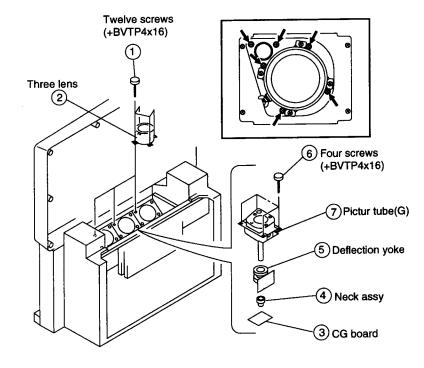
### 2-9. MIRRER COVER ASSY REMOVAL



### 2-10. HIGH-VOLTAGE CABLE INSTALLATION



### 2-11. PICTURE TUBE REMOVAL



# SECTION 3 SET-UP ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SCREEN VOLTAGE ADJUSTMENT (ROUGH AIIGNMENT)  1. Turn the red VR on the FOCUS block all the way to the left and then gradually turn it to the right until the point where you can see the retrace line.  2. Next gradually turn it to the left to the position where the retrace line disappears.  FOCUS LENS ADJUSTMENT	Monoscope Pattern		PICTUREminimum BRIGHTNESS50% SCREEN (G2)	FOCUS block
<ol> <li>Loose the lens screw.</li> <li>Set in service mode.</li> <li>Use VSP on the service mode menu to shown only the green color.</li> <li>Press the Commander Menu button and select FEATURES and CONVERGENCE to display the test signal on the screen.</li> <li>Rotate the green lens and align with the optimal focus point from the test signal.</li> <li>Use RRH from the service mode menu to set to green and red.</li> <li>Output the test signal and rotate the red lens to obtain the optimum focus at the point where the red and green spots overlap.</li> <li>Use RBH from the service mode menu to set to red and blue.</li> <li>Output the test signal and rotate the blue lens to obtain the optimum focus at the point where the blue and red spots overlap.</li> <li>Tighten the lens screw.</li> </ol>				CONVERGENCE
SCREEN ADJUSTMENT(G2)  1. Select VIDEO mode without signals. 2. Connect an oscilloscope to the TP7103(KR), TP7203(KG) and TP7303(KB) of CR board, CG board and CB board. 3. Adjust R. G.and B screen voltage to 175VDC with screen VR on the focusblock.				170±VDC pedestal

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
FOCUS VR ADJUSTMENT				<b>←→</b>
<ol> <li>Set in service mode.</li> <li>Use VSP on the service mode menu to shown only the green color.</li> <li>Press the Commander Menu button and output the test signal.</li> <li>Rotate the green VR on the FOCUS block and align to obtain the optimal focus point.</li> <li>Use RRH from the service mode menu to set to green and red.</li> <li>Output the test signal and rotate the red VR to obtain the optimum focus at the point where the red and green spots overlap.</li> <li>Use RBH from the service mode menu to set to red and blue.</li> <li>Output the test signal and rotate the blue VR aligning to obtain the optimum focus at the point where the blue and red spots overlap.</li> </ol>				Lens Scanning line visible.  Minimize both A and B.
<ol> <li>DEFLECTION YOKE TILT ADJUSTMENT</li> <li>Set in service mode.</li> <li>Set to receive the monoscope signal.</li> <li>Use VSP on the service mode menu to shown only the green color.</li> <li>Loosen the deflection yoke setscrew and align the tilt of the Deflection Yoke so that the bars at the center of the monoscope pattern are horizontal.</li> <li>After aligning the deflection yoke, fasten it securely to the funnel-shaped portion (neck) of the CRT.</li> <li>The tilt of the deflection yoke for red is aligned with RRH on the service mode menu, and the tilt on the deflection yoke for green is aligned with RBH on the service menu, is aligned the same as was done for green.</li> </ol>	Monoscope pattern			2-pole magnet  Deflection yoke  Neck Assy  Anode cap

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
2-POLE MAGNET ADJUSTMENT				
<ol> <li>Set in service mode.</li> <li>Set to receive the dot pattern signal.</li> <li>Place the caps on the red and blue lens so that only the green color is shown.</li> <li>Turn the green VR on the focus block to the right and set to overfocus to enlarge the spot.</li> <li>Now align the 2-Pole Magnet so that the enlarged spot is in the center of the Just Focus spot.</li> <li>Align the green focus VR and set for just (precise) focus.</li> <li>Perform the same alignment for red and blue.</li> </ol>	Dot pattern		2-pole magnet	Use the center dot
<ol> <li>4-POLE MAGNET ADJUSTMENT</li> <li>Set in service mode.</li> <li>Set to receive the dot pattern signal.</li> <li>Place the caps on the red and blue lens so that only the green color is shown.</li> <li>Turn the green VR on the focus block to the left and set to underfocus to enlarge the spot.</li> <li>Now align the 4-Pole Magnet so that the enlarged spot becomes a perfect circle.</li> </ol>	Dot pattern		4-pole magnet	Use the center dot $x = y$ $x : y = 1 : 2$

Use of Remote Commander (RM-Y890) can be performed circuit adjustments about this model.

**ELECTRICAL ADJUSTMENT BY REMOTE COMMANDER** 

### **NOTE: Test Equipment Required.**

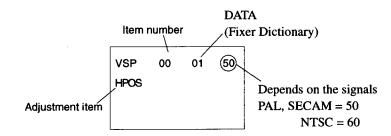
- 1. Pattern Generator
- 2. Frequency counter
- 3. Digital multimeter
- 4. Audio oscillator

### 1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

### SERVICE MODE PROCEDURE

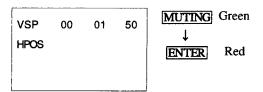
- 1. Standby mode. (Power off)
- 2.  $\overline{DISPLAY} \rightarrow 5 \rightarrow \overline{VOL} (+) \rightarrow \overline{POWER}$  on the Remote Commander. (Press each button within a second.)

### SERVICE ADJUSTMENT MODE IN

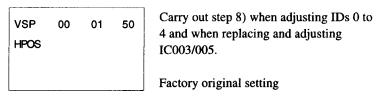


- 3. The CRT displays the item Being adjusted.
- 4. Press 1 or 4 on the Remote Commander to select the item.
- 5. Press 3 or 6 on the Remote Commander to change the data.
- 6. If you want to recover the latest values press 0 then ENTER to lead the memory.
- 7. Press MUTING then ENTER to write into memory.

### SERVICE ADJUSTMENT MODE MEMORY



8. Press 8 then ENTER on the Remote Commander to initialize.

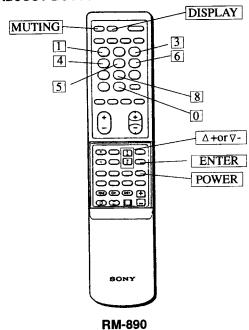


9. Turn set off and on to exit.

### 2. MEMORY WRITE CONFIRMATION METHOD

- 1. After adjustment, pull out the plug from AC outlet, and next place, plug in AC outlet
- 2. Turn the power switch ON and set to Service Mode.
- 3. Call the adjusted items again, confirm they were adjusted.

### 3. ADJUST BUTTONS AND INDICATOR



### 4. SERVICE MODE LIST

### **VSP**

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SCREEN MODE WZ: WIDE ZOOM, F / N: FULL / NORMAL, Z / ST: ZOOM / SUB TILT

	Item	Adjustment	Data	Ini	tial da	ata	Note	Device
	number	item	range	wz	F/N	Z/ST	Note	Device
VSP	00	HPOS	0~63	30	30	30	H-SHIFT	CXD2018Q
	01	VSIZ	0~63	35	32	32	V-SIZE	(V DSP)
	02	VPOS	0~63	17	17	17	V-SHIFT	
	03	vsco	0~15	0	7	7	S-CORRECTION	
	04	VLIN	0~15	12	10	10	V-LIN	
	05	HSIZ	0~63	40	30	30	H-SIZE	
	06	HPIN	0~63	23	27	27	PIN-AMP	
	07	HKEY	0~31	17	17	17	TILT(TILT)	
	08	UPCP	0~15	6	6	6	UP-COR-PIN	
	09	LOCP	0~15	6	9	9	LOW-COR-PIN	
	10	HBOW	0~15	8	8	8	V-BOW	
	11	HSKE	0~15	8	8	8	V-ANGLE	

**DP**SCREEN MODE WZ:WIDE ZOOM, F/N:FULL/NORMAL, Z/ST:ZOOM/SUBTILT

<u> </u>	Item	Adjustment	·	Ini	tial da	ata		
	number	item	Data range	wz	F/N	Z/ST	Note	Device
R GH	00	CENT	-127 ~ +127	0	0	0	SUB G. H CENTER	CXP85112
	01	SKEW	-127 ~ +127	0	0	0	SUB G. H SKEW	(REGI µCOM)
	02	BOW	-127 ~ +127	0	0	0	SUB G. H BOW	
	03	4 BOW	-127 ~ +127	0	0	0	SUB G. H 4th BOW	
İ	04	SIZE	-127 ~ +127	0	0	0	SUB G. H SIZE	
	05	LIN	-127 ~ +127	5	0	0	SUB G. H LINEARITY	
	06	M SIZ	-127 ~ +127	-45	0	0	SUB G. H MID SIZE	
	07	M LIN	-127 ~ +127	0	0	0	SUB G. H MID LINEARITY	
	08	KEY	-127 ~ +127	0	0	0	SUB G. H KEYSTONE	
l	09	SSKW	-127 ~ +127	0	0	0	SUB G. H SUB SKEW	
1	10	M PIN	-127 ~ +127	0	0	0	SUB G. H MID PINCUSHION	
	11	PIN	-127 ~ +127	0	0	0	SUB G. H PINCUSHION	
	12	SBOW	-127 ~ +127	0	0	0	SUB G. H SUB BOW	
	13	M BOW	-127 ~ +127	0	0	0	SUB G. H MID BOW	
	14	4PIN	-127 ~ +127	0	-40		SUB G. H 4th PINCUSHION	,
	15	4 SBO	-127 ~ +127	0	0	0	SUB G. H 4th SUB BOW	i i
R GV	00	CENT	-127 ~ +127	0	0	0	SUB G. V CENTER	
	01	SKEW	-127 ~ +127	0	0	0	SUB G. V SKEW	
	02	BOW	-127 ~ +127	3	3	3	SUB G. V BOW	
	03	SIZE	-127 ~ +127	0	0	0	SUB G. V SIZE	ļ
	04	LIN	-127 ~ +127	0	0	0	SUB G. V LINEARITY	
	05	M SIZ	-127 ~ +127	10	0	0	SUB G. V MID SIZE	
	06	M KEY	-127 ~ +127	0	0	0	SUB G. MID KEYSTONE	
	07	KEY	-127 ~ +127	10	10	10	SUB G. V KEYSTONE	
	08	S SKW	-127 ~ +127	0	0	0	SUB G. V SUB SKEW	
	09	M PIN	-127 ~ +127	15	10	10	SUB G. V MID PINCUSHION	
	10	PIN	-127 ~ +127	- 15	- 10	- 10	SUB G. V PINCUSHION	
	11	S BOW	-127 ~ +127	0	0	0	SUB G. V SUB BOW	
	12	WAVE	-127 ~ +127	0	0	0	SUB G. V 3th WAVE SUB G. V 4th PINCUSHION	
	13	4PIN	-127 ~ +127	-15	0	0	SUB R. H CENTER	1
R RH	00	CENT	-63 ~ +63	0		1 -	SUB R. H SKEW	
1	01	SKEW	-127 ~ +127	0	0	0	SUB R. H BOW	
	02	BOW	-127 ~ +127	0	0	0	SUB R. H 4th BOW	
1	03	4BOW	-127 ~ +127	0	0	0	SUB R. H SIZE	
	04	SIZE	-127 ~ +127	0	1	0	SUB R. H LINEARITY	
	05	LIN	-127 ~+127	5	0	0	SUB R. H LINEARTT	
	06	MSIZ	-127 ~ +127	5	0	0	SUB R. H MID LINEARTIY	
	07	MLIN	-127 ~ +127	0	0	0	SUB R. H KEYSTONE	
	08	KEY	-127 ~ +127	0	0	0	SUB R. H SUB SKEW	
	09	SSKW	-127 ~ +127 -127 ~ +127	10	5	5	SUB R. H MID PINCUSHON	
L	10	MPIN	-12/~+12/	10	1 3		SOD K. II MILD I INCOSTORY	1

	Item	Adjustment	Data range		tial da		Note	Device
	number	item	Data range	WZ		Z/ST		
R GH	11	PIN	-127 ~ +127	0	5	5	SUB R. H PINCUSHON	CXP85112
	12	SBOW	<b>−127 ~ +127</b>	45	45	45	SUB R. H SUB BOW	(REGI µCOM)
	13	MBOW	-127 ~ +127	0	0	0	SUB R. H MID BOW	
	14	4PIN	-127 ~ +127	0	-4	-4	SUB R. H 4th PINCUSHON	
	15	4SBO	-127~+127	0	0	0	SUB R. H 4th SUB BOW	
R RV	00	CENT	-63 ~ +63	30	30	30	SUB R. V CENTER	
	01	SKEW	-127 ~ +127	0	0	0	SUB R. V SKEW	
	02	BOW	-127 ~ +127	3	3	3	SUB R. V BOW	
	03	SIZE	-127 ~ +127	- 10	- 10	- 10	SUB R. V SIZE	
	04	LIN	-127 ~ +127	0	0	0	SUB R. V LINEARITY	
	05	MSIZ	-127 ~ +127	7	0	0	SUB R. V MID SIZE	
	06	MKEY	-127 ~ +127	8	8	8	SUB R. V MID KEYSTONE	
	07	KEY	-127 ~ +127	- 15	-15	- 15	SUB R. V KEYSTONE	
	08	SSKW	-127 ~ +127	0	0	0	SUB R. V SUB SKEW	
	09	MPIN	<b>−127 ~ +127</b>	15	10	10	SUB R. V MID PINCUSHON	
	10	PIN	<b>−127 ~ +127</b>	15	-5	-5	SUB R. V PINCUSHON	
	11	SBOW	-127 ~ +127	0	0	0	SUB R. V SUB BOW	
	12	WAVE	-127 ~ +127	0	0	0	SUB R. V 3th WAVE	
	13	4PIN	-127 ~ +127	- 15	0	0	SUB R. V 4th PINCUSHON	
R BH	00	BSEL	0~1	0	0	0	0:R-MUTE 1:G-MUTE	
	01	CENT	-63 ~ +63	0	0	0	SUB B. H CENTER	
	02	SKEW	<b>−127 ~ +127</b>	0	0	0	SUB B. H SKEW	
	03	BOW	-127 ~ +127	0	0	0	SUB B. H BOW	
	04	4BOW	-127 ~ +127	0	0	0	SUB B. H 4th BOW	
	05	SIZE	-127 ~ +127	0	0	0	SUB B. H SIZE	
	06	LIN	-127 ~ +127	5	0	0	SUB B. H LINEARITY	
	07	MSIZ	-127 ~ +127	-40	0	0	SUB B. H MID SIZE	
	08	MLIN	-127 ~ +127	-5	0	0	SUB B. H MID LINEARTTY	
	09	KEY	-127~+127	0	0	0	SUB B. H KEYSTONE	
	10	SSKW	-127~+127	0	0	0	SUB B. H SUB SKEW	
	11	MPIN	-127~+127	10	5	5	SUB B. H MID PINCUSHON	
	12	PIN	-127 ~ +127	0	5	5	SUB B. H PINCUSHON	
	13	SBOW	<b>−127 ~ +127</b>	-45	-45	-45	SUB B. H SUB BOW	
	14	MBOW	-127~+127	0	0	0	SUB B. H MID BOW	
	15	4PIN	<b>−127 ~ +127</b>	0	-4	-4	SUB B. H 4th PINCUSHON	
	16	4SBO	-127~+127	0	0	0	SUB B. H 4th SUB BOW	
R BV	00	CENT	-63 ~ +63	30	30	30	SUB B. V CENTER	
	01	SKEW	-127 ~ +127	0	0	0	SUB B. V SKEW	
	02	BOW	-127 ~+127	3	3	3	SUB B. V BOW	
1	03	SIZE	-127~+127	- 10	- 10	- 10	SUB B. V SIZE	
	04	LIN	-127 ~ +127	0	0	0	SUB B. V LINEARITY	
	05	MSIZ	-127~+127	7	0	0	SUB B. V MID SIZE	
	06	MKEY	-127 ~ +127	-8	-8	-8	SUB B. V MID KEYSTONE	

	Item Adjustment number item	Adjustment	Data range		tial d	ata	<b>A</b> 1-4-	Device
		item	Data range	WZ	F/N	Z/ST	Note	
R BV	07	KEY	-127~+127	5	5	5	SUB B. V KEYSTONE	
	08	SSKW	-127 ~ +127	0	0	0	SUB B. V SUB SKEW	
	09	MPIN	-127 ~ +127	15	0	0	SUB B. V MID PINCUSHON	
	10	PIN	-127 ~ +127	- 10	- 30	- 30	SUB B. V PINCUSHON	
	11	SBOW	-127 ~ +127	0	0	0	SUB B. V SUB BOW	
	12	WAVE	-127~+127	0	0	0	SUB B. V 3th WAVE	
	13	4PIN	-127 ~ <b>+</b> 127	- 15	0	0	SUB B. V 4th PINCUSHON	

### D/A

	Item number	Adjustment item	Data range	Initial data	Note	Device
D/A	00 01	BKU BKD	0 ~ 63 0 ~ 63	50 10	BLK UP-SIDE BLK DOWN-SIDE	CXA1315M

### MCD

	Item number	Adjustment item	Data range	Initial data	Note	Device
MCD	00	MHUE	0 ~ 31	15	Main NTSC Hue for main picture	TDA9141
		1			(Off Set)	(Main CHROMA DECODER)

### SCD

	Item number	Adjustment item	Data range	Initial data	Note	Device
SCD	00	SHUE	0 ~ 31	15	Sub NTSC Hue for main picture	TDA9160A
					(Off Set)	(SUB CHROMA DECODER)

### ΑP

	Item number	Adjustment item	Data range	Initial data	Note	Device
AP	00	FAW	0 ~ 255	10	NICAM FAW THRESH	MSP3410
	01	CTM	0 ~ 255	8	ERROR BIT MONO	(AUDIO PROS / STEREO
	02	CTN	0 ~ 255	80	ERROR BIT NICAM	DECODER)
	03	WGO	0 ~ 255	10	DIFFERENCE (W / G)	
	04	WGS	0 ~ 255	21	DECISION POINT (STEREO W / G)	
	05	WGT	0 ~ 255	80	TIMER (W / G)	
	06	WGB	0 ~ 255	234	W, G, CONST	
	07	ACG	0~1	1	AGC AUTO / CONST	
	08	CDB	0 ~ 127	40	AGC GAIN / CONST	
	09	FMP	0 ~ 127	34	FM MONO PRESCALE	
	10	WGP	0 ~ 127	60	W, G, PRESCALE	
	11	NIP	0 ~ 127	127	NICAM PRESCALE	
ļ	12	CRM	0~1	0	CARRIA MUTE	
l	13	ACO	0~1	1	AUDIO CLOCK OUT	
1	14	WAC	0~1	1	W / G JUDGEMENT	

	Item number	Adjustment item	Data range	Initial data	Note	Device
PIP	00	RDV	0 ~ 15	5	V READ DELAY	SDA9188
					(OFF SET TO EACH POSITION)	(PINPPROCESSOR)
	01	RDH	0 ~ 63	17	H READ DELAY	
			İ		(OFF SET TO EACH POSITION)	
	02	FRY	0 ~ 15	4	FRAME BRIGHTNESS	
	03	9V50	0 ~ 7	3	MULTI PIP V 50Hz	
	04	9H50	0 ~ 7	3	MULTI PIP V 50Hz	
	05	9V60	0~7	3	MULTI PIP V 60Hz	
	06	9H60	0~7	3	MULTI PIP V 60Hz	
	07	SCON	0~15	8	PIP SUB CONTRAST	

### IPQ

	Item number	Adjustment item	Data range	Initial data	Note	Device
IPQ	00	CIN	0~1	0	CINE MODE 0: OFF, 1: ON	83C652
	01	107	0~1	1	SET TMS4C1070	( FIELD DOBLE /
	02	LFR	0~1	1	LINE FLICKER REDUCTION	ASPECT CONV )
					0 : OFF, 1 : ON	
	03	HWE	0 ~ 15	13	H PISITION (ADJUSTMENT	
					AT NORMAL MODE)	
ĺ	04	NR	0~3	2	NOISE REDUCTION LEVEL	
	05	Y-V	0 ~ 127	80	Y LEVEL FOR BACKGROUND	
	06	UV-V	0 ~ 127	0	UV LEVEL FOR BACKGROUND	
	07	PEAK	0~127	8	PEAKING LEVEL	
	08	CTI	0 ~ 127	64	CTI LEVEL	
	09	VWE	0 ~ 63	26	VWEI DELAY	
	10	2BLO		0		
	11	BOXP		0		

### CPU

	Item number	Adjustment item	Data range	Initial data	Note	Device
CPU	00	OSH	0 ~ 63	23	OSD POSITION H	CXP5400
	01	ODL	0 ~ 255	15	POWER ON DELAY	(SYS, µCOM)
	02	WIDE	0~1	1	RELAY FOR WIDE MODEL	
					0:4:3 1:16:9	
	03	TWIN	0~1	1	0 : Sub V FIELD PROCESSING	
					1 : Sub V FRAM PROCESSING	
	04	DSPC	0 ~ 1	1	0 : ENABLE RECEIVE OF CHANNEL	
					IDENTICAL TO TWIN PICTURE	
					1 : DISABLE RECEIVE OF CHANNEL	
}					IDENTICAL TO TWIN PICTURE	
i	I	1	1	1		

### TXT

	Item number	Adjustment item	Data range	Initial data	Note	Device
TXT	00	TXH	0 ~ 255	10	TEXT H POSITION	TPU3040
	01	TXV	0 ~ 127	46	TEXT V POSITION	( TEXT PROCESSOR )
	02	VSP	0 ~ 255	59	WST LAYER V STOP	
	03	BSP	0 ~ 255	61	BLANKING STOP	
	04	BST	0 ~ 255	53	BLANKING START	
	05	QSF	0 ~ 31	1	ACQ SOFT SLICER	
	06	A7F	0 ~ 63	10	ADD 7FH DATA	
	07	QDT	0 ~ 63	13	ACQ DATA SLICER	
	08	CST	0 ~ 127	0	CLAMPING START	
	09	CSP	0 ~ 255	80	CLAMPING STOP	
	10	LMT	0~1	0	LIMIT SLICER ADAPT	
	11	GMX	0 ~ 255	31	GAIN MAX	
	12	FMX	0 ~ 255	31	FILTER MAX	
	13	TVER	0~	3	TEXT VERSION	
	14	VSP	0 ~ 255	59	WST LAYER V STOP	

### RGB

	Item number	Adjustment item	Data range	Initial data	Note	Device
RGB	00	SCOL	0 ~ 63	31	SUB COLOR (OFF SET)	TDA4780
-	01	SBRT	0 ~ 63	31	SUB BRUGHT (OFF SET)	(RGB VIDEO PROCESSOR)
	02	RAMP	0 ~ 63	31	RED GAIN FOR WHITE BALANCE	
	03	GAMP	0 ~ 63	31	GREEN GAIN FOR WHITE	
					BALANCE	
	04	BAMP	0 ~ 63	48	BLUE GAIN FOR WHITE BALANCE	
	05	RCUT	0 ~ 63	31	RED CUT OFF FOR WHITE	
					BALANCE	
	06	GCUT	0 ~ 63	31	GREEN CUT OFF FOR	
					WHITE BALANCE	
	07	BCUT	0 ~ 63	48	BLUE CUT OFF FOR	
					WHITE BALANCE	
	08	PDL	0 ~ 63	20	PEAK DRIVE LIMITER LEVEL	
	09	GNMA	0 ~ 63	20	GANMA	
	10	AFBL	0 ~ 1	0	ACTIVE BLACK 0 : OFF, 1 : ON	
	11	RELC	0 ~ 1	1	RELATIVE C/O	
	12	TCPL	0~1	1	TIME CONST PEAK LIMITER	
					0:2fH, 1:1fH	
	13	AXIS	0~1	1	NTSC AXISAL	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
CONVERGENCE ADJUSTMENT				
<ul> <li>When replacing the deflection yoke, always perform</li> <li>"DEFLECTION YOKE TILT ADJUSTMENT" before adjusting the convergence.</li> <li>Adjustments should be proceeded individually per mode:</li> </ul>				
"FULL MODE", "ZOOM MODE", and "WIDE ZOOM".  "FULL""FULL" and "NORMAL" modes data  "ZOOM""ZOOM" and "CHARACTER" modes data				
"WIDE ZOOM" "WIDE ZOOM" mode data				
1. To copy the data from "FULL MODE" to "ZOOM MODE", press 2 and 0 on the remote commander.				
2. After the adjustment, write the data in memory by pressing MUTING and 0 on the remote commander.				
3. For the data copy between 50 and 60Hz, press DISPLAY and O on the commander.				
Adjustment procedure				
R GH (SUB), R GV (SUB)  R RH (SUB), R RV (SUB)  R BH (SUB), R BV (SUB)				

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
[ FULL MODE ADJUSTMENT ]	•			
CONVERGENCE MAIN ADJUSTMENT				
Receive the signal and set at "FULLMODE", select the adjustment item in service mode.	Monoscope pattern or Crosshatch			
GREEN REGISTRATION ADJUSTMENT	pattern		<vsp menu=""></vsp>	
V-SHIFT adjustment			VPOS (02)	VPOS
J				
V-LINEARITY adjustment			VLIN (04)	VLIN
V-SIZE, V-CORRECTION adjustment			VSIZ (01)	VSIZ
While tracking, adjust so that the lattice intervals for V-SIZE and VSCO are equal.			VSCO (03)	
				vsco
H-SHIFT adjustment			HPOS (00)	HPOS
H-SIZE adjustment			HSIZE (05)	HSIZE
Finely adjust with SUB MSIZE.				
• PIN-AMP adjustment			HPIN (06)	HPIN
Finely adjust with SUB MPIN.				

	FOLUDIATION	MEAGUDEMENT	AD HIGTMENT	HILLICT PATION AND CHARF
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
UPPER/LOWER-CORNER PIN adjustment     Correct the screen top and bottom section line bow.     However, if this adjustment is overdone, distortion may occur with the PIN-AMP adjustment that can not be adjusted away.			UPCP (08) LOCP (09)	UPCP →
Note: The PIN-AMP adjustment adjusts the overall screen from top to bottom, but the UPPER/LOWER-CORNER PIN adjustments have just large movement in the top and bottom sections, so be careful.		·		LOCP -
V-ANGLE, V-BOW adjustment     Correct the tilt and bow of the vertical line at the center of the screen.			HSKE (11) HBOW (10)	HSKE
				HBOW ← (((((((((((((((((((((((((((((((((((
• TILT adjustment Adjust to eliminate the tilt of one of the two vertical lines at both ends of the screen.			HKEY (07)	HKEY ←

ADJUSTMENT ITEM AND PROCEDURE								EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
CONVERGENCE SUB ADJUSTMENT											
Adjustme	ent O: Yes	-: N	Ю								
Display	Adjustment item		F	Adjustn	nent typ	oe .					
	Adjustment item	RGH	RGV	RRH	RRV	RBH	RBV				
BSEL	COL SELECT	-	_	_	-	О	_				
CENT	CENT	0	0	0	0	0	0				
SKEW	SKEW	0	0	0	0	0	0				
BOW	BOW	0	0	0	0	0	0				
4BOW	4TH BOW	0	_	0	-	0	-				
SIZE	SIZE	0	0	0	0	0	0				
LIN	LIN	0	0	0	0	0	0				
MSIZ	MID SIZE	0	0	0	0	0	0				
MLIN	MID LIN	0	0	0	_	0	-				
MKEY	MID KEY	_	0	_	0	_	0				
KEY	KEY	0	0	0	0	0	0				
SSKW	SUB SKEW	0	О	0	0	0	0				
M PIN	MID PIN	0	0	0	0	0	0				
PIN	PIN	0	0	0	0	0	0				
SBOW	SUB BOW	0	0	0	0	0	0				
WAVE	WAVE	-	0	_	0		0				
MBOW	MID BOW	0	_	О	_	О	_				
4PIN	4TH PIN	0	0	0	0	0	0				
4SBOW	4TH SUB BOW	0	_	0	1	0	-				

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN SUB ADJUSTMENT SCREEN CENTER SECTION GREEN VERTICAL LINE				
ADJUSTMENT			<rgh menu=""></rgh>	Watch and only facilities
Finely adjust with RGH CENT, RGH BOW, RGH SKEW.     Adjust watching out for the RGH CENT screen center section.			RGH CENT (00) RGH BOW (02) RGH SKEW (01)	Watch out only for the GH CENT center point.
				Watch the vertical center line.
2. RGH 4TH BOW adjustment			RGH 4BOW (03)	RGH CENT  RGH BOW  RGH SKEW  RGH 4BOW
Correct the corner distortion that could not be adjusted away with the RGH BOW adjustment.			KGII 4BOW (US)	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SCREEN CENTER SECTION GREEN HORIZONTAL LINE			<rgv menu=""></rgv>	
ADJUSTMENT				
Finely adjust the center position of the vertical line at the center of the screen with RGV CENT.			RGV CENT (00)	Watch the horizontal center line.  Watch out only for the RGV CENT center point.
				RGV CENT
Correct the tilt and bow of the horizontal line at the center of the screen with RGV SKEW and RGV BOW.			RGV SKEW (01) RGV BOW (02)	RGV SKEW
				RGV BOW
			<rgh menu=""></rgh>	
<ol> <li>GREEN SIZE AND LINEARITY ADJUSTMENT</li> <li>Balance the sizes at both sides of the center section of the screen with RGH MLIN.</li> <li>Balance the sizes on both end sections of the screen with RGH LIN.</li> </ol>			RGH MLIN (07) RGH LIN (05)	MLIN ()
<ol> <li>While tracking, adjust with RGH MLIN and RGH LIN so that the sizes of the horizontal line at the center of the screen are symmetrical left and right.</li> </ol>				- Lin

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL SIZE ADJUSTMENT			<rgh menu=""></rgh>	
1. Adjust with RGH MSIZE so that the sizes of both ends and of both sides of the center section of the screen are equal.			RGH MSIZ (06)	
2. Adjust with RGH SIZE so that the horizontal sizes of both ends and of both sides of the center section of the screen are equal.			RGH SIZE (04)	MSIZ () SIZE
3. While tracking, adjust with RGH MSIZ and RGH SIZE so that the lattice intervals for the horizontal line section of the center section of the screen are equal and so that the horizontal size is the prescribed value.				
4. If M LIN is changed when the RGH MSIZ and RGH SIZE adjustment is complete, adjust again while tracking.				GH MSIZ GH LIN  GH SIZE
●With just the H SIZE adjustment in MAIN, if there is no need to adjust RGH SIZE in SUB this can save power.				
GREEN VERTICAL LINEARITY ADJUSTMENT				
Adjust RGV LIN so that the vertical lines at the top and bottom of the screen are symmetrical.			<rgv menu=""> RGV LIN (04)</rgv>	-

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<ol> <li>GREEN VERTICAL SIZE ADJUSTMENT</li> <li>Adjust with RGV MSIZE so that the sizes for the top and bottom sections of the screen and for both sides of the center section of the screen are equal.</li> <li>Set the vertical size to the prescribed value with RGV SIZE.</li> <li>Adjust RGV MSIZ and RGV SIZE watching the vertical line at the center section of the screen.</li> <li>While tracking, adjust with RGV MSIZ and RGV SIZE so that the lattice intervals for the vertical line section of the center section of the screen are equal and so that the vertical size is the regulation value.</li> <li>If RGV LIN is out of place when the RGV MSIZ and RGV SIZE adjustment is complete, adjust again while tracking.</li> <li>If there is no need to adjust RGV SIZE in SUB with just the V SIZE adjustment in MAIN, this can save power.</li> </ol>			<rgv menu=""> RGV MSIZ (05)  RGV SIZE (03)</rgv>	MSIZ SIZE GV LIN GV SIZE GV MSIZ
GREEN HORIZONTAL TRAPEZOIDAL DISTORTION  ADJUSTMENT  1. Adjust with RGH SSKW so that the tilt of the vertical lines at both ends of the screen is symmetrical left and right.  2. Adjust with RGH KEY so that there is no tilt in the vertical lines at both ends of the screen.  3. If there is a tilt on either the left or right after the RGH KEY adjustment, adjust while tracking.			<rgv menu=""> RGH SSKW (09) RGH KEY (08)</rgv>	SS KW () KEY

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL QUATERNARY ADJUSTMENT			<rgh menu=""></rgh>	
<ol> <li>Correct the quaternary distortion with RGH 4PIN.</li> <li>While balancing, correct the quaternary distortion of both end sections of the screen with RGH 4SBO.</li> <li>While tracking, adjust with RGH 4PIN and RGH 4SBO.</li> </ol>			RGH 4PIN (14) RGH 4SBO (15)	4 PIN () 4SBO
<ol> <li>GREEN HPRIZONTAL ASYMMETRICAL PIN DISTORTION ADJUSTMENT         <ol> <li>Adjust with RGH MBOW so that the pin asymmetry at both sides of the center section of screen is symmetrical.</li> <li>Adjust with RGH SBOW so that the bow at both end sections of the screen is symmetrical left and right.</li> <li>While tracking, adjust with RGH MBOW and RGH SBOW so that the bow of vertical lines on the entire screen is symmetrical left and right.</li> </ol> </li> </ol>			<rgh menu=""> RGH MBOW (13) RGH SBOW (12)</rgh>	M BOW S BOW

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL SYMMETRICAL PIN DISTORTION			<rgh menu=""></rgh>	
ADJUSTMENT				
<ol> <li>Adjust the pin distortion at both sides of the center section of the screen with RGH MPIN.</li> <li>Adjust the pin distortion at both end sections of the screen with RGH PIN.</li> <li>While tracking, adjust with RGH MPIN and RGH PIN so that</li> </ol>			RGH MPIN (10)	M PIN
the PIN of vertical lines on the entire screen have no bowing.  4. If there is asymmetrical pin distortion after the RGH MPIN and RGH PIN adjustments, adjust with RGH MBOW and RGH SBOW while tracking.			RGH MBOW (13) RGH SBOW (12)	PIN
●With just the PIN AMP adjustment in MAIN, if there is no need to adjust RGV PIN in SUB, this can save power.				GH MBOW  GH PIN GH SBOW  GH MPIN
GREEN VERTICAL WAVE (TERTIARY DISTORTION)			<rgv menu=""></rgv>	
ADJUSTMENT				
Take the screen top and bottom horizontal lines with RGV WAVE and find the secondary and quaternary waveform.			RGV WAVE (12)	RGV WAVE
There is KEY distortion after the RGV WAVE adjustment, so adjust with GV WAVE and RGV KEY while tracking.			RGV KEY (07)	RGV KEY

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN VERTICAL QUATERNARY DISTORTION			<rgv menu=""></rgv>	
ADJUSTMENT				
Correct the quaternary distortion of the horizontal lines at the top and bottom sections of the screen with RGV 4PIN.			RGV 4PIN (13)	RGV 4PIN
<ol> <li>Since there is no 4SBO for vertical correction, there will be a slight imbalance, but adjust to eliminate the distortion from the horizontal line at either the top or the bottom of the screen.</li> <li>In many cases, the horizontal lines at the top and bottom sections of the screen are not straight lines after the adjustment. As long as the secondary distortion is mild enough that it can be corrected with the PIN adjustment, this is OK.</li> </ol>				
GREEN VERTICAL TRAPEZOIDAL DISTORTION			<rgv menu=""></rgv>	
ADJUSTMENT	•		RGV SSKW (08)	RGV SSKW
<ol> <li>Adjust with RGV SSKW so that the tilt of the horizontal lines at the top and bottom sections of the screen is symmetrical about the center position horizontal line.</li> <li>Adjust with RGV MKEY so that there is no tilt for the line</li> </ol>			RGV MKEY (06)	RUV SSRW
sections at both sides of the horizontal lines at the center section of the stream.  3. Adjust with RGV KEY so that there is no tilt for the horizontal lines at the top and bottom sections of the screen.			RGV KEY (07)	MKEY
4. While tracking, adjust with RGV MKEY and RGV KEY so that there is no tilt for the horizontal lines on the entire screen.				KEY
5. If the tilt is unbalanced after the RGV MKEY and RGV KEY adjustment, adjust again with RGV SSKW.			RGV SSKW (08)	GV SSKW GV MKEY

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN VERTICAL ASYMMETRICAL PIN DISTORTION			<rgv menu=""></rgv>	
(SECONDARY DISTORTION) ADJUSTMENT				
Correct the asymmetrical pin distortion at the top and bottom sections of the screen with RGV SBOW.			RGV SBOW (11)	RGV SBOW
GREEN VERTICAL ASYMMETRICAL PIN DISTORTION			<rgv menu=""></rgv>	
<ol> <li>Adjust the pin distortion for both side sections and the center of the screen with RGV MPIN.</li> <li>Adjust with RGV PIN so that the horizontal lines at the top and bottom sections of the screen are straight lines.</li> <li>Adjust with RGV MPIN and RGV PIN so that there is no curve in the horizontal lines on the entire screen.</li> </ol>			RGV MPIN (09) RGV PIN (10)	MPIN
4. After the adjustments in Items 1-3, adjust the tracking with RGV SBOW, RGV MPIN, and RGV PIN.			RGV SBOW (11)	GV SBOW  GV MPIN  GV PIN

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN AND RED REGISTRATION ADJUSTMENT				
<ol> <li>(RRH, RRV)</li> <li>Receive a PAL cross-hatch signal.</li> <li>Adjust so that the red lines lay on the green lines.         Adjust with the same procedure as the GREEN SUB adjustment.     </li> </ol>	PAL Cross-hatch pattern			
<ol> <li>Notes: 1. The main correction is not carried out during red registration adjustment.</li> <li>Beware. The green adjustment items can be changed by mistake.</li> <li>Unlike for green, adjust within the range -124 ~ +124.</li> </ol>				
GREEN AND BLUE REGISTRATION ADJUSTMENT				
(RBH, RBV)  1. Receive a PAL cross-hatch signal.  2. Adjust so that the blue and green lines are on top of each other.  Notes: 1. The main correction is not carried out during RED registration adjustment.  2. Beware. The GREEN and RED adjustment items can be changed by mistake.	PAL Cross-hatch pattern			
<ol> <li>Receive "ALL WHITE SIGNAL" and confirm the registration.</li> <li>After the registration adjustment in "FULL MODE", write the data in memory by pressing MUTING and 0 on the remote commander.</li> <li>Then, copy the data of "FULL / ZOOM" by pressing 2 and 0 on the commander and copy the data of "50/60Hz" by pressing DISPLAY and 0.</li> </ol>				

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
WHITE BALANCE ADJUSTMENT  1. Receive the monoscope pattern signal and adjust the picture quality with the menu.  2. Adjust service mode SBRT so that the signal 10 IRE section barely glows.  3. Receive the all-white pattern signal.  4. Adjust the white balance with service mode GCUT and BCUT.  5. Adjust service mode SBRT so that the signal 100 IRE section barely glows.  6. Adjust the white balance with service mode GAMP and BAMP.  7. Repeatedly adjust the white balance for the minimum and maximum picture settings.				

## SECTION 4 ELECTRICAL ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
B BOARD ADJUSTMENT  COLOR ADJUSTMENT  1) SUB-HUE AND SUB-COLOR ADJUSTMENT (MAIN SCREEN) 1. Input the signal and put the set into service mode. 2. Connect an oscilloscope between connector on the B(1/4) board. 3. Adjust SHUE and SCOL so that Vw = Vcy = VMg=VBI in the waveform levels. 4. Write the data to memory.	Color Bar pattern Oscilloscope	CN4 ⑦ pin (B(1/4) Board)	SHUE, SCOL: Vw = Vcy = VMg = VBI  MUTING  INTERES	
<ol> <li>SUB-HUE (P IN P SCREEN)</li> <li>Input the signal and put the set into service mode.</li> <li>Connect an oscilloscope between connector on the B(1/4) board.</li> <li>Adjust SHUE so that Vw = Vcy = VMg=VBI in the waveform levels.</li> <li>Write the data to memory.</li> </ol>	Color Bar pattern Oscilloscope	CN4 ⑦ pin (B(1/4) Board)	ENTER  SHUE:  Vw = Vcy = VMg = VBI  MUTING  ↓ ENTER	Vw Vcy VMg VBI  63.5 μsec  CN4 ⑦ pin OUTPUT> (TWIN PICTURE MODE)  W Cy Mg BI W Cy Mg BI  Yw G R Bk Yw G R Bk
SUB BRIGHTNESS ADJUSTMENT  1. Receive the signal and adjust the picture quality with the menu. 2. Adjust service mode SBRT so that the signal 10 IRE section barely glows.	Monoscoope pattern		PICTUREMinimum SBRT	Vw Vcy VMg VBI Vw Vcy VMg VBI
1. Upon receiving the signal, select NORMAL in SCREEN mode. 2. In SERVICE mode adjust "HWE" so that the video signal is balanced on left and right (symmetrical).	Monoscoope pattern		HWE  MUTING  ↓ ENTER	MAIN P IN P SCREEN SCREEN  31.75 µsec

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
P IN P POSITION ADJUSTMENT  1. Upon receiving the Monoscope signal, select FLL in SCREEN mode.  2. Set SERVICE mode and then press the P in P command twice. The P in P positon will then move periodically to four points.  Adjust "RDV" and "RDH" on the new screen so that the four points are distributed equally at; up, down, left and right.	Monoscope pattern		RDV (side) RDH (length)	
1. Receive the overlapping TEXT signal. 2. Set the TEXT in MIX mode and adjust the screen positon with "TXH" and "TXV".  OSD POSITION ADJUSTMENT  1. Receive the Color signal and select a mode other than NORMAL mode. 2. Adjust "OSH" so that the center line of the signal and the center of the crosshairs of the OSD display match are aligned with each other.	PAL COLOR Bar pattern		TXH TXV  MUTING  ENTER  OSH  MUTING  ENTER	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
[ZOOM MODE ADJUSTMENT]  V BLANKING SIZE ADJUSTMENT  1. Receive PAL monoscope signal and set at "ZOOM MODE".  2. Select "BKU" in D/A menu.  3. Reduce the data value by pressing 3 and 6 on the commander to adjust blanking size and minimize the shear on the screen top.  4. Select "BKD" in D/A menu.  5. Raise the data value by pressing 3 and 6 on the commander to adjust blanking size and minimize the shear on the screen bottom.	PAL Monoscoope pattern	POSITION	LOCATION	AND NUMBER
<ol> <li>V SIZE ADJUSTMENT</li> <li>Receive PAL monoscope signal and set at "ZOOM MODE".</li> <li>Select "V SIZE" in VSP menu.</li> <li>Set the V size at 9.4 ± 0.312 by pressing 3 and 6 on the commander.</li> <li>* • After the registration adjustment in "ZOOM MODE", write the data in memory by pressing MUTING and 0 on the commander.</li> <li>• Then, copy the data of "50/60Hz" by pressing DISPLAY and 0.</li> <li>* • "WIDE ZOOM" proceed MAIN and SUB REGISTRATION ADJUSTMENT like "FULL MODE".</li> </ol>	PAL Monoscoope pattern			
<ul> <li>After the registration adjustment in "ZOOM MODE", write the data in memory by pressing MUTING and 0 on the commander.</li> <li>Then, copy the data of "50/60Hz" by pressing DISPLAY and 0.</li> </ul>				

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
H SIZE ADJUSTMENT  1. Receive a PAL monoscope signal to set to "ZOOM MODE".  2. Set to Service Mode.  3. Select H SIZE of VSP menu with the commander buttons 1 and 4.  4. Adjust to 15.5 ± 0.3 square with 3 and 6.	PAL Monoscoope pattern			
[WIDE ZOOM ADJUSTMENT]  S CORRECTION ADJUSTMENT  1. Receive a PAL monoscope signal to set to "WIDE ZOOM".  2. Set to Service Mode.  3. Select VSCO of VSP menu with the commander buttons 1 and 4.  4. Adjust to data "00" with 3 and 6.	PAL Monoscoope pattern			
<ol> <li>V SIZE ADJUSTMENT</li> <li>Receive a PAL monoscope signal to set to "WIDE ZOOM".</li> <li>Set to Service Mode.</li> <li>Select V SIZE of VSP menu with the commander buttons 1 and 4.</li> <li>Adjust to 11.2 ± 0.2 square with 3 and 6.</li> </ol>	PAL Monoscoope pattern			
<ol> <li>H SIZE ADJUSTMENT</li> <li>Receive a PAL monoscope signal to set to "WIDE ZOOM".</li> <li>Set to Service Mode.</li> <li>Select H SIZE of VSP menu with the commander buttons and 4.</li> <li>Adjust to 15.5 square with 3 and 6.</li> </ol>	PAL Monoscoope pattern			

## SECTION 5 SAFETY RELATED ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE			ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER		
[ E BOARD ]  ■ R988 RESISTOR CONFIRMATION METHOD (HV HOLD DOWN CONFIRMATION) AND ADJUSTMENTS  The following adjustments should always be performed when replacing the following components (marked with on the schematic diagram).		✓ marked parts C4057, D4026, R988, R4019, T4002, T4003 (FBT), E BOARD, HV Block	■ R988	Remove the cap off from the unused terminal and connect a static voltmeter there.		
<ol> <li>Remove the cap for the unconnected pin in the high-voltage block and connect a HIGH-VOLTAGE Voltmeter.</li> <li>Receive the Dot signal and set the PICTURE and BRIGHTNESS setting to their minimums.</li> <li>Connect a 68kΩ variable resistor across the E board CN4007 connector ( with the variable resistor set to its minimum).</li> <li>Gradually upper the value of the variable resistor and check that the hold down circuit operates at a HIGH-VOLTAGE Voltmeter reading of 34.40 ± 0.40kVDC and that the rasters disappear.</li> <li>When the hold-down circuit starts operating, switch OFF the power of the set immediately.</li> <li>Remove the VR connected to CN4007 and measure resistance value.</li> <li>Solder a resistor (METAL OXIDE 1/4W), whose resistor value is equivalent to measured above, to CN4007 in place of the VR.</li> <li>Check Item 5 again.</li> </ol>	HIGH-VOLTAGE Voltmeter Dot signal	HV Block  CN4007  HIGH-VOLTAGE Voltmeter 34.40 ± 0.40kVDC	PICTUREminimum BRIGHTNESSminimum	CN4006  CN4007  CN4007  CN4007  CN4007		

ADJUSTMENT ITEM AND PROCEDURE  R983 RESISTOR CONFIRMATION METHOD ( HV REGULATION CONFIRMATION ) AND READJUSTMENTS  The following adjustments should always be performed when replacing the following components ( marked with  on the schematic diagram )  1. Remove the cap for the unconnected pin in the high-voltage	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
	AND SIGNAL	☐ marked parts C4033, C4034, C4046, C4047, C4049, D4012,	■ R983	E BOARD -COMPONENT SIDE-
	HIGH-VOLTAGE	D4018, D4023, D4028, D4035, R983, R4022, R4046, R4047, R4048, R4053, R4054, R4057, R4059, R4060, R4061, R4077, R4079, R4086, R4087, R4088, R4091, R4092, R4097, R4098, R4100, Q4013, T4002, T4003 (FBT), E Board HV Block		CN4006  O O  CN4007
<ol> <li>block and connect a HIGH-VOLTAGE Voltmeter.</li> <li>Receive the Dot signal and set the PICTURE and BRIGHTNESS settings to their minimums.</li> <li>Connect a 68kΩ variable resistor across the E board CN4006 connector ( with the variable resistor set to its maximum).</li> </ol>	Voltmeter Dot signal	HV Block CN4006	PICTUREminimum BRIGHTNESSminimum	CN4006
<ol> <li>Gradually lower the value of the variable resisotr and check that the hold down circuit operates at a HIGH-VOLTAGE Voltmeter reading of 31.00 ± 0.30k VDC and that the rasters disappear.</li> <li>When the hold-down circuit starts operating, switch OFF the power of the set immediately.</li> <li>Remove the VR connected to CN4006 and measure resistance value.</li> <li>Solder a resistor (METAL OXIDE 1/4W), whose resistor value is equivalent to measured above, to CN4006 in place of</li> </ol>		HIGH-VOLTAGE Voltmeter 31.00 ± 0.30k VDC		68KΩ
the VR.  8. Check Item 5 again.				

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER		
ADJUSTMENT ITEM AND PROCEDURE  IV HOLD DOWN ADJUSTMENT WITHOUT USING IV REGULATOR ( PICTURE: 80%, BRIGHTNESS: 50%)  Turn off the power of the projector, and remove R983 from CN4006 and R988 from CN4007.  Fix a 47kΩ VR onto CN4006 with solder, and set the resistor value at maximum.  Fix a 68kΩ VR onto CN4007 with solder, and set the resistor value at minimum.  Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin.  Slowly turn the 47kΩ VR that is soldered to CN4006, and gradually lower the voltage of IC4001 ⑤ pin down to 1.67VDC Slowly turn the 68kΩ VR that is soldered to CN4007, and gradually raise the resistor value until the raster disappears and the HV hold down circuit starts operating.	AND SIGNAL					
<ol> <li>Remove the 68kΩ VR from CN4007, and measure the resistor value with the digital voltmeter. Put a resistor ( metal oxide, 1/4W ) that has same value as the measured resistor onto CN4007 and solder it.</li> <li>Set the value of the 47kΩ VR on CN4006 at the maximum. Receive DOT signal ( PICTURE : 80%, BRIGHTNESS : 50% ).</li> <li>Turn on the power of the projector.</li> <li>Connect a digital voltmeter to IC 4001 ⑤ pin.</li> <li>Slowly turn down the 47kΩ VR that is connected to CN4006 to gradually lower the voltage of IC4001 ⑤ pin between 1.62 to 1.7VDC, and check if the raster disappears and the hold down circuit operates.</li> <li>Turn off the power of the projector.</li> <li>Remove the 47kΩ VR from CN4006. Put back the removed</li></ol>			PICTURE80% BRIGHTNESSCENTER	CN4007 CN4006 O O 68ΚΩ  47ΚΩ		

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER		
<ol> <li>Receive DOT signal (PICTURE: 80%, BRIGHTNESS: 50%).</li> <li>Turn off the power of the projector.</li> <li>Remove ■R983 from CN4006.</li> <li>Fix a 47kΩ VR onto CN4006 with solder, and set the resistor value at maximum.</li> <li>Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin.</li> <li>Slowly turn the 47kΩ VR that is soldered to CN4006, and gradually lower the voltage of IC4001⑤ pin down to 1.49VDC.</li> <li>Turn off the power of the projector.</li> </ol>	Dot signal		R983 PICTURE80% BRIGHTNEScenter	E BOARD  IC4001  CN4006  CN4006  CN4007		
<ol> <li>Remove the 47kΩ VR from CN4006, and measure the resistor value with the digital voltmeter. Put a resistor ( metal oxide, 1/4W ) that has same value as the measured resistor onto CN4006 and solder it.</li> <li>Turn on the power of the projector. Check if th evoltage of IC4001 (3) pin is between 1.46 nad 1.53VDC.</li> <li>Receive FULL WHITE signal ( PICTURE : 80%, BRIGHTNESS : 50% ).</li> <li>Turn off the power of the projector.</li> </ol>				CN4006 Ο Ο 47ΚΩ		
<ul> <li>[ G BOARD ]</li> <li>+B MAX VOLTAGE CONFIRMATION</li> <li>The following adjustments should always be performed when replacing IC6002 and R6054.</li> <li>1. Supply 230VAC to with variable autotransformer.</li> <li>2. Input an entirely monoscope signal.</li> <li>3. Set the PICTURE control and the BRIGHT controls in to initial reset.</li> <li>4. Confirm the voltage of G BOARD CN6014 ① pin connecter is less than 134.50 ± 1.00VDC.</li> <li>5. If step 4 is not satisfied, replace IC6002 and R6054 repeat above steps.</li> </ul>				G BOARD  - COMPONENT SIDE -  R6054 ① ⑥ CN6014  IC6002		

#### 6-5. SEMICONDUCTORS

BA7046F LM358D LM393PS NJM2234M NJM2235M NJM2240M NJM4558M µPC4558G2



CXA1315M HD74HC123AP HEF4046BT-T MC14046BDWR2 MC14053BCP MC74F163AM MC74HC163AF MC74HC4053F MC74HC4538F TDA4665T-T µPD4053BC



CXA1817S



CXA1855S



CXD2018Q



CXD2024AQ



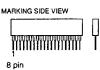
CXP5068H-244Q CXP85460-005Q



CXP85112B-613S



CX20125



LA7856A PA0053B TDA2579B



LM358P LM393P ST24016CM1-TR/A μPC358C μPC393C



MB81C1000A-80PSZ



TOP VIEW

MC14066BF MC74F00M MC74F08DR2 MC74F08M MC74F74M MC74HC00AF MC74HC74AF



MN1382S



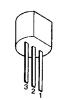
MSP3410 P83C652FBA-V3/AB517 TPU3040



NJM2058D



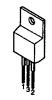
NJM78L05A



NJM78M12FA NJM7805FA PQ09RF2 TA7812S



NJM7905FA NJM7912FA



PM0002B



PQ05RF1



PQ12RF1



SAA4940H-T



SAA4951WP/V1-T



SAA7158WP-T



SBX1780-51



SDA9187-2XGEG SDA9188-3XGEG

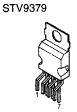


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STR81159A





S-80743AL-A7-S



TC4S66F



TDA4650/V4 TDA4780/V3



TDA6111Q



TDA7265



TDA8755T-T



TDA9141-N2C TDA9160A



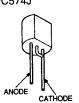
TL431CLP



μPC339C



μPC574J



ZA2970-26DTR



36 pin

BF550



DTA114EKA-T146 DTA144EKA-T146 DTC114EKA-T146 DTC114EK DTC144EKA-T146 2SA1037K-T-146-QR 2SA1162G 2SB709A-QRS-TX 2SC1623-L5L6 2SC2412K-QR 2SC2712-YG



DTA144ESA



IRFI640 2SA1837 2SC4105-N 2SC4793



2SA1013-O 2SA1208



2SA1175-HFE 2SA1309A-QRS 2SC2785-HFE 2SC3311A-QRSTA 2SC3623A-LK



2SA1221-L 2SA1221-T-M 2SB733-34 2SB734-T-4 2SD774-34



2SA1301-O



2SB649A 2SC2688-LK



2SC2878-AB



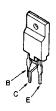
2SC3997CA
MARKING SIDE VIEW



2SC4025MNPR



2SC4632LS-CB7



2SC4834P



BAS16 BBY40



DAN202K



DAP202K



DA204K 1SS226



D1NL20 EGP20G GP08D HZT33-02 RGP02-20EL-6394 RGP15GPKG23 1SS83



D1NS4 D1N20R RD12ES-B2 RD13ES-B2 RD18ES-B2 RD2.4ES-B2 RD20ES-B2 RD27ES-B2 RD3.3ES-B2 RD33ES-B1 RD39ES-B2 RD4.3ES-B2 RD5.6ES-B2 RD7.5ES-B2 RD8.2ES-B2 RD9.1ES-L RD9.1EW RM11C 1SS119-25 155133



D10SC4MR



D10SC4M D10SC6M D8LC40



D10SC6MR



D10XB60S RBA-4068



D2L40-TA



ERC06-15S ERC91-02 S2LA20F



ERC38-06 V19E



ERD08M-15



MA110



MA3024-TX MA3033-L MA3047-TX MA3051M MA3075M MA3130 RD13M-B2 RD2.0M-B2 RD2.1M-B2 RD5.1M-B2 RD5.1M-B2 RD7.5M-B2



SC802-06

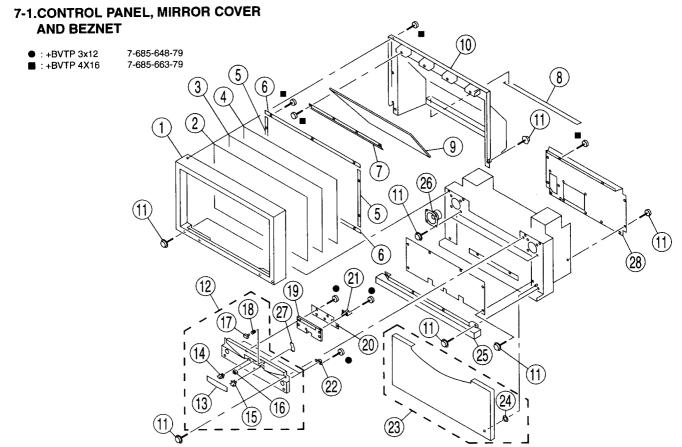


\$1WB60B



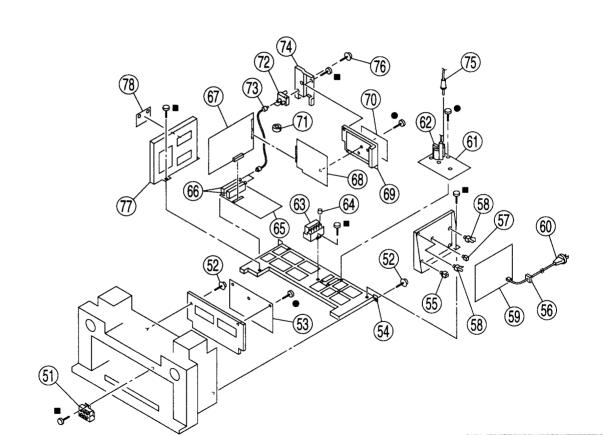
**TLR124** 





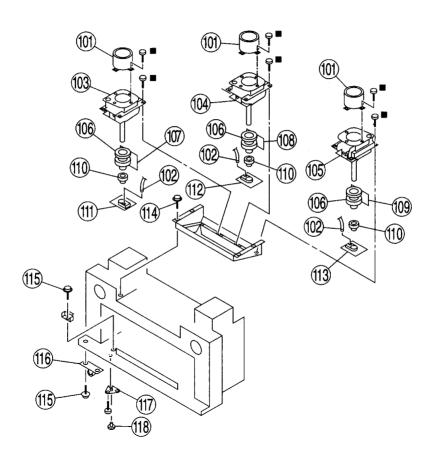
#### 7-2. CHASSIS

●: +BVTP 3x12 7-685-648-79 ■: +BVTP 4X16 7-685-663-79



#### 7-3. PICTURE TUBE

■: BVTP 4X16 7-685-663-79



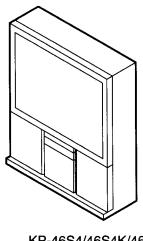
# **SERVICE MANUAL**

# RX-1E CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KP-46S4	RM-831	AEP	SCC-N24A-A	KP-53S4	RM-831	AEP	SCC-N24B-A
KP-46S4K	RM-831	OIRT	SCC-N25A-A	KP-53S4K	RM-831	OIRT	SCC-N25B-A
KP-46S4U	RM-831	UK	SCC-N26A-A	KP-53S4U	RM-831	UK	SCC-N26B-A



RM-831



KP-46S4/46S4K/46S4U KP-53S4/53S4K/53S4U





#### **SPECIFICATIONS**

Front

Sound output

Television system

B/G/H,D/K,I,L

Colour system

PAL/SECAM and NTSC 3.58/NTSC4.43

(VIDEO IN)

Channel coverage

See "Receivable channels and channel

displays " at the bottom.

Projected picture size 116cm (46 inches)

**Terminals** 

133cm (53 inches)

Rear

Center speaker input terminals,

2 terminals

(L,R), audio outputs - phono jacks

(variable)

1, 21-pin Euro connector

(CENELEC standard)

-inputs for audio and video signals

- inputs for RGB

- outputs of TV audio and video signals

 $\implies$  2/ $\implies$  2, 21-pin Euro connector

- inputs for audio and video signals

- inputs for S Video

- outputs for audio and video signals

(selectable)

-S 2, S video inputs - 4 pin DIN

• (L,R), audio inputs - phono jacks

→ 4/ - 4 4, 21-pin Euro connector

- inputs for audio and video signals

- inputs for S video

- outputs for audio and video signals

(monitor out)

-s 4, S video inputs - 4 pin DIN

→ (L, R), audio inputs - phono jacks

S - S video outputs 4-pin DIN (monitor out)

→ (L, R), audio outputs - phono jacks (fixed)

3, video input-phono jack

(L, R), audio inputs-phono jacks

-s 3, S video input-4-pin DIN

(i), headphone jack - stereo minijack

2 x 30W (music power)

2 x 15W (RMS)

Power consumption 225W

Dimensions(WxHxD) KP-46S4K: 1104 x 1267 x 512 mm

KP-53S4K: 1164 x 1335 x 650 mm

KP-46S4K: 79kg Weight

KP-53S4K: 90kg

Supplied accessories RM-831 Remote Commander

One IEC designation R6 battery

Other features Digital comb filter (High resolution)

PIP (Picture-in-picture)

**FASTEXT** 

NICAM (B/G, L, I) **B/G STEREO** D/K STEREO

Design and specifications are subject to change without notice.

#### Receivable Channels and Screen Displays

_	Receivable channels	Indication on the screen	
PAL B/G/H	E212 2169	C02 C03 C04C12 C21C69	
CABLE TV (1)	S141	S01 S02S41	
CABLE TV (2)	S01S05 M1M10 U1U10	S42S46 S01S10 S11S20	
ITALIA	ABCDEFGHH1H2 2169	C11C69	
SECAM D/K	R01R12 R21R60	C02C12 C21C60	
SECAM L	F2F10 F21F69	C01C12 C21C69	
PAL I	B21 B68	C21C68	

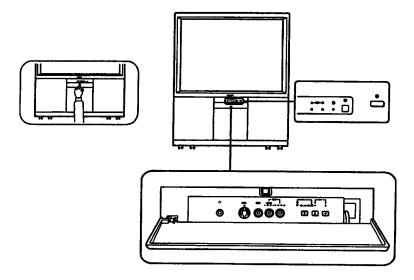
**Overview** 

# SECTION 1 GENERAL

The operation instruction mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.

This section briefly describes the buttons and controls on the TV set and on the Remote Commender. For more information, refer to the pages given next to each description.

#### TV set-front



Symbol .	Name	Refer to page
Φ	Main power switch	7, 13
ø	Standby indicator	13
A-CD-B	Stereo A/B indicators	15
Ω	Headphones jack	22
<b>-6</b> 03,-€3,-€3	input jacks (S video/video/audio)	22
<b>آس</b>	Function selector (Programme/volume/input)	14
-/+	Adjustment buttons for function selector	14

# TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation TV/Teletext operation

Remote commander RM-831

Note The SAT button does not operate with this TV.

#### TV/Teletext operation

Symbol	Name	Refer to page
<b>«</b>	Mute on/off button	14
O	Standby button	13
0	TV power on/TV mode selector button	13
<b>®</b>	Teletext button	14
Ð	Input mode selector	14
<b>-</b>	Output mode selector	23
1,2,3,4,5,6, 7,8,9,and 0	Number buttons	13
<b>+-</b>	Double-digit entering button	13
С	Direct channel entering button	10
<b>∆+</b> /−	Volume control button	13
PROGR+/-	Programme selectors	13
88 88	Teletext page access buttons	19
•	Picture adjustment button	15
Þ	Sound adjustment button	15
3	On-screen display button	14
B)	Teletext hold button	19
9	Time display button	14
	Fastext buttons	19

Simple side

Full-Function side
PIP (Picture-in-picture) operation

Symbol	Name	Refer to page
•	PIP on/off button	17
t	PIP source selector	17
Ø	Swap button	17
<b>3</b>	PIP position changing button	17

#### Menu operation

Symbol	Name	Refer to page	
MENU	Menu on/off button	7	
Δ+/∇-	Select buttons	7	
ОК	OK(confirming)button	7	
<b>-</b>	Back button	7	

#### Video operation

Symbol	Name	Refer to page
VTR1/2/3, MDP	Video equipment selector	24
44 ► → ■ N • 0 PROGR +/-	Video equipment operation buttons	24

## **Step 1 Preparation**



Note: Always remembe

to dispose of used

environmental friends

na ni sehetled

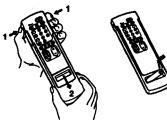
• Check the supplied accessories

When you've taken everything out of the carton, check that you have these items:



RM-831 Remote Commander One IEC designation R6 battery

2 Insert the battery into the Remote Commander

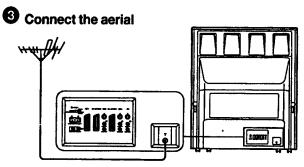






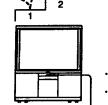
Refit the outside cover making sure that the Full-Function side is visible to use

the menu in step 2.



Fit an IEC serial connector attached to 75-ohm coaxial cable (not supplied) to the 'T' socket at the rear of the TV.

## **Step 2 Adjusting Colour Registration** (CÓNVERGENCE)



(main power switch)

**6** 

**6'6'9 0** 

Before you begin

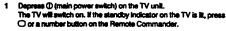
green, and blue).

Check that the Full-Function side of the Remote Commander is

Once you have set up the TV, you can choose the language of the menu. Then you should converge the three colour layers (red.

Locate Menu operation buttons on the Remote Commander. They are shaded in the illustration at the left.

Choose a language



The LANGUAGE menu appears, (See Fig. 1).

- 3 Select the language you want with  $\Delta + \text{ or } \nabla \text{ and press OK}$ .
- 4 Press to return to the main menu.

#### 2 Display the menu

Press MENU.

The main menu appears. (See Fig.2)

MENU

#### 3 Converge the red, green and blue lines

- Select "CONVERGENCE" with  $\Delta + \text{or } \nabla \text{and press OK.}$ The CONVERGENCE menu appears. (See Fig. 3.)
- 2 Select "the line" you want to adjust with △+ or ∇-. Key to line adjustment symbols:
  - I (red vertical left/right adjustment)
  - (red horizontal up/down adjustment)
  - I (blue vertical left/right adjustment)
  - (blue horizontal up/down adjustment)
- 3 Press OK.
- The line to adjust is selected.
- 4 Press  $\Delta$ + or  $\nabla$  to converge the selected line with the centre green line and press OK

To move up (horizontal line) To move right (vertical line)	Press ∆+
To move down (horizontal line)	Press ∇
To move left (vertical line)	

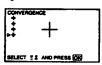
- 5 Repeat steps 2 to 4 to adjust the other lines, until all the lines have overlapped to form a white cross. (See Fig. 4.)
- 6 Press MENU to return to TV picture.

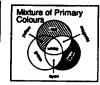






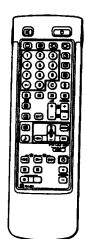






## Step 3 Tuning in to TV Stations





To go back to the main menu Keep pressing -.

To stop autometic channel presetting Press - on the Remote Commander.

#### Notes

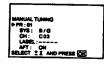
6

- After presetting the channels autometically, you can check which channels are stored on which programme positions.
- You can exchange the programme positions to have them appear on screen in the order you like. For details, see "Exchanging the Programme Positions" on page 10.

You can preset the channels (up to 100 channels) by choosing either the automatic or manual method.

The automatic method is easier if you want to preset all receivable channels at once. Use the manual method if you only have a few channels and want to preset channels one by one.

AUTO TUNING POT 876 COR SELECT II AND PRESS (EX)



#### **Preset Channels Automatically**

- 1 Press MENU to display the main menu.
- 2 Select "PRESET" with △+ or ∇- and press OK. The PRESET menu appears. (See Fig. 5.)
- 3 Select "AUTO TUNING" with Δ+ or ∇- and press OK. The AUTO TUNING menu appears. (See Fig. 6.)
- 4 Select the programme with 4--and enter the digit numbers from which you want to start presetting.
- 5 Press OK. Select if necessary the TV broadcast system with Δ+ or ∇ = and press CK. (B/G for western European countries, D/K for eastern European countries, L for France and i for the United Kingdom.)
- 6 Using ∆+ or ∇-, select C (to start presetting regular channels) or S (to start presetting cable channels) and press OK. The automatic channel presetting starts. When presetting is finished, the preset menu reappears. All available channels are now stored on successive number buttons. If you want to change to another broadcasting system, repeat
- 7 Press MENU to return to TV picture.

steps 3 to 5.

PRESET
PAUTO TURING
PAUTO TURING
MARIAL TURING
PROOR EXCHANGE
SELECT 22 AND PRESS (DE)

Fig. 5



Fig. 6

Use this method if there are only a few channels in your area to preset or if you want to preset channels one by one.

If you have made a

Press - to go back to

the previous position.

To return to the main

Keep pressing -.

#### Preset Channels Manually

- Press MENU to display the main menu.
- 2 Select "PRESET" with △+ or ∇- and press OK. (See Fig. 7.)
- 3 Select "MANUAL TUNING" with  $\Delta +$  or  $\nabla -$  and press OK. The MANUAL TUNING menu appears. (See Fig. 8.)
- 4 Using △+ or ∇-, select the programme position to which you want to preset a channel, and press OK. You can also select the programme position with the number buttons (e.g. for programme 24, press -/--, 2 and 4).
- 5 Select, if necessary, the TV broadcast system (B/G for western European countries, D/K for eastern European countries, L for France and I for the United Kingdom) with ∆+ or ∇−. Then press OK.
- 6 Using ∆+ or ∇-, select C (to start presetting regular channels) or S (to start presetting cable channels) and press CK.
- 7 Press Δ+ or ∇- until the channel you want appears on the screen. You can also select the channel directly using the number buttons. Press C (once for VHF/UHF channels, twice for cable TV channels), then the number buttons (e.g., for channel 5, press 0 and 5).
  Then press OK.

To preset other channels Repeat steps 4 to 7.

To return to TV picture
Press MENU.

GB<sup>'</sup>

PRESET
PAUTO TUNING
MANUAL TUNING
PROGRE EXCHANGE
SELECT 22 AND PRESS (C)

Fig. 7

MANUAL TURING
PPR: St
PR: St
St
CH: CO3
AFT: ON
SELECT 25 AMO PRESS (M)

She (

This section shows you additional presetting functions such as exchanging or skipping programme positions, captioning a station name, and manual fine-tuning.

You can skip this section, if not needed.

#### Before you begin

- Check that the Full Function side of the Remote
- Commander is visible.
- Locate the Menu operation buttons.

## PROGRAMME S EXCHANGE

**6** 

0000 စြစ်စ်စာ ••• **6.6.9**0 

If you have made a Press - to go back to the previous position

To go back to main Keep pressing -.

#### **Exchanging Programme Positions**

With this function, you can exchange the programme positions to a preferable order.

- 1 Press MENU to display the main menu.
- Select "PRESET" with  $\Delta +$  or  $\nabla -$  and press OK. The PRESET menu appears.
- Select "PROGRAMME EXCHANGE" with  $\Delta +$  or  $\nabla -$  and press

The PROGRAMME EXCHANGE menu appears. (See Fig. 9.)

- 4 Using ∆+ or ∇-, select the programme position you want to exchange with another and press OK.
- 5 Using  $\Delta$ + or  $\nabla$ -, select the programme position to be exchanged and press OK. Now the two programme positions have been exchanged.
- 6 Repeat steps 4 and 5 to exchange other programme positions.
- 7 Press MENU to return to TV picture.

#### Tuning in to a Channel Temporarily

You can tune in to a channel temporarily, even when it has not been preset. Use the buttons on the Full-Function side of the Remote Commander.

- Press C on the Remote Commander for regular channels, or twice to get cable channels.
  - The indication "C" ("S" for cable channels) appears on the screen.
- 2 Enter the double-digit channel number using the number buttons (e.g. for channel 4, first press 0, then 4). The channel appears.

However, the channel will not be stored.



MOVE PROT TO PR--

Flg. 10

#### MANUALITUNING

#### **Skipping Programme Positions**

You can skip unused programme positions when selecting programmes with the PROGR +/- buttons. However, the skipped programmes may still be called up when you use the number

- 1 Press MENU to display the main menu.
- Select "PRESET" with  $\Delta + \text{ or } \nabla \text{ and press OK.}$ The PRESET menu appears.
- Select "MANUAL TUNING" with  $\Delta + \text{ or } \nabla \text{ and press OK.}$ The MANUAL TUNING menu appears, (See Fig. 11.)
- Using  $\Delta +$  or  $\nabla -$ , select the programme position which you want to skip and press OK.
- 5 Press △+ or ∇- until "---" appears in the SYS position. (See Fig.

If you have made a Press - to go back to

the previous position.

To go back to main Keep pressing -.

When you select programmes using the PROGR +/- buttons, the

programme position will be skipped.

- Repeat steps 4 to 6 to skip other programme positions.
- 8 Press MENU to return to TV picture.

# LABEL:----APT: ON BELECT II AND PRESS (CK)

GB

Fig. 11



Flg. 12

#### MANUAL TUNING

#### Captioning a Station Name

You can "name" a channel using up to five characters (letters or numbers) to be displayed on the TV screen (e.g. BBC1). Using this function, you can easily identify which channel you are watching.

- 1 Press MENU to display the main menu.
- 2 Select "PRESET" with ∆+ or ∇- and press OK. The PRESET menu appears.
- Select "MANUAL TUNING" with ∆+ or ∇- and press OK. The MANUAL TUNING menu appears.
- Select "PR" with ∆+ or V- and press OK.
- 5 Select programme position you want to caption with  $\Delta +$  or  $\nabla -$  and press OK.
- 6 Select "LABEL" with Δ+ or ∇- and press OK.
- 7 Select a letter or number with ∆+ or ∇- and press OK. Select other characters in the same way, if you want to leave an element blank, select - and press OK. (See Fig. 13.)
- 8 Repeat steps 4 to 7 to caption names for other channels.
- Press MENU to return to TV picture.

MARIAL TURING
PR:01
SYS: 8/G
CH: COS
P LABEL: BONY
AFT: ON
SELECT 28 AND PRESS (TS)

To reactivate AFT

beginning and select

Reneal from the

"ON" in step 7.

 $\infty$ 

(automatic fine tuning)

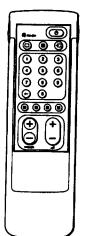
#### Manual Fine-Tuning

Normally, the AFT (automatic fine-tuning) is already operating. However, if the picture is distorted, you can use the manual fine tuning function to obtain better picture reception.

- Press MENU to display the main menu.
- 2 Select "PRESET" with ∆+ or ∇- and press OK. The PRESET menu appears.
- 3 Select "MANUAL TUNING" with  $\Delta +$  or  $\nabla -$  and press OK. The MANUAL TUNING menu appears.
- 4 Select "PR" with △+ or ∇- and press OK.
- 5 Select programme position you want to manually fine-tune with  $\Delta +$  or  $\nabla -$  and press OK.
- 6 Select "AFT" with Δ+ or ∇- and press OK.
- 7 Select "OFF" with ∆+ or ∇- and press OK. (See Fig. 14.)
- 8 Fine-tune the channel with ∆+ or ∇- so that you get the best TV reception. As you press the cursor buttons, the frequency changes from - 128 to + 127.
- 9 After fine tuning, press OK. Now the fine-tuned level is stored.
- 10 Repeat steps 4 to 9 to fine-tune other channels.
- 11 Press MENU to return to TV picture.

MANUAL TUNING
PR: 01
SYS: B/G
CH: C03
LABEL:---P AFT: OFF
BELECT 2.1 AND PRESS (OK)

## Watching the TV



If no picture appears when you depress 0 on the TV and If the standby Indicator on the TV is Itt, the TV is in standby mode. Press O or one of the number buttons to switch it on.

This section explains the basic functions you use while watching TV. Most of the operations can be done using the simple side of the Remote Commander.

#### Switching the TV on and off

Switching on

Depress @ (main power switch) on the TV unit.

#### Switching off temporarily

Press & on the Remote Commander. The TV enters standby mode and the standby indicator on the front of the TV lights up.

#### To switch on again

Press O, PROGR 4/-, or one of the number buttons on the Remote Commander.

#### Switching off completely

Depress @ (main power switch) on the TV unit.

#### **Selecting TV Programmes**

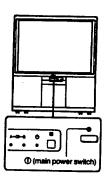
Press PROGR +/-- or press the number buttons.

#### To select a double-digit number

Press ---, then the numbers. For example, If you want to choose 23, press ---, 2, and 3.

#### **Adjusting the Volume**

Press 4+/-.



## Operating the TV Using the Buttons on the TV

With the -/+ buttons on the TV, you can select programmes, adjust the volume, and select video input sources.

To switch on the TV from the standby mode Press the -/+ buttons.

To reset picture and sound controls to the factory preset level (RESET function)

Press the -/+ buttons simultaneously.

To select TV programmes

Press Para repeatedly until the programme number appears, then press the -/+ button to select.

To adjust the volume

Press Frame repeatedly until the Allill appears, then press the + button to adjust. (See Fig. 15.)

To select video input sources

Press F—— repeatedly until the — (video input indication) appears, then press the —4 button to select. Each pressing the button, the indication changes as follows.



. 0.000

<u>4</u>일

After the video input source is selected, the  $\angle$ IIIII appears. Press the  $-\!\!/+$  button to adjust the volume. (See Fig. 16.)

#### **Watching Teletext or Video Input**

#### Watching teletext

- 1 Press @ to view the teletext.
- For teletext operation, enter a 3-digit page number with the number buttons to select a page.
   For testext operation, press one of the coloured buttons.
   For both operations, press ⊕ (PAGE +) for the next page or ⊕ (PAGE -) for the preceding page.
- 3 To go back to the normal TV picture, press O.

#### Watching a video input picture

Press - repeatedly until the desired video input appears.

2 To go back to the normal TV picture, press O.

#### **More Convenient Functions**

Use the Full-Function side of the Remote Commander.

Displaying the on screen indications

- Press @ once to display all the indications.
- Press @ again to make the Indications disappear.

#### Muting the sound

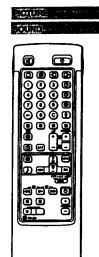
Press **≪**.

To resume normal sound, press ≪ again.

#### Displaying the time

Press ②. This function is available only when teletext is broadcast. To make the time display disappear, press ② again.

# Adjusting and Setting the TV Using the Menu



#### Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste. You can also select dual sound (bilingus) programmes when available or adjust the sound for listening with the headphones.

Press (for picture) or .) (for sound) on the remote Commander.

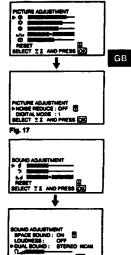
Press MENU and select "PICTURE" or "SOUND," then press OK. The PICTURE ADJUSTMENT or SOUND ADJUSTMENT menu appears. (See Fig. 17 or Fig. 18.)

2 Using \( \Delta + \text{ or } \nabla -, select the item you want to adjust and press OK. To move up/down:

From  $\square$  position, press  $\nabla$  – to move down. From  $\square$  position, press  $\triangle$  + to move up.

III means next page.
III means previous page.

- 3 Adjust the setting with △+ or ∇- and press OK. For the effect of each control, see the table below.
- Frepeat steps 2 and 3 to adjust other items.
- 5 Press MENU to return to TV picture.



SELECT II AND PRESS OK

#### Effect of each control

PICTURE ADJUSTMENT	Effect
(contrast)	Less manue More
☼ (brightness)	Darker www Brighter
(colour)	Less More
-Chue)	Greenish assess-assess Reddish
(D (sharpness)	Softer same Sharper
RESET	Resets picture to the factory preset levels.
NOISE REDUCE	OFF: Normal ON: When reducing the picture noise
DIGITAL MODE	1: Line Flicker reduction on.
••	2: Line Flicker reduction off.

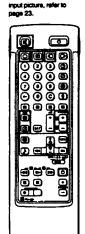
SOUND ADJUSTMENT	Effect
4 (Trebie)	Less and More
?(Bass)	Less More
△ (Balance)	More left More right
RESET	Resets sound to the factory preset levels.
SPACE SOUND	OFF: Normal ON: Obtain acoustic sound effect.
LOUDNESS	OFF: Normal ON: When listening to low volume sound.
DUAL SOUND*	A: left channel : B: right channel Stereo mono
	STEREO ←→ MONO
	The selected mode of the A-CD-B indicator on the TV lights up.
	Less A management

\*When receiving a NICAM programme

NICAM stereo/monaural STEREO NICAM → MONO

NICAM bilingual

NICAM A → NICAM B → MONO



For details of the teletext

For details of the video

operation, refer to

page 19.

Presence
Press = to go back to
the previous position.
To go back to the main
menu
Keep pressing =.

Note Hue is only available for NTSC colour systems.

Note on LINE OUT
The audio level and the
duel sound mode output
trom the G- jack on the
rear correspond to the
Headphone VOLUME
and DUAL SOUND
settings.

When wetching a video input picture You can select DUAL SOUND to change the sound.

## PIP (Picture In Picture)

FEATURES ....

#### **Using the SLEEP TIMER**

You can select a time period after which the TV automatically switches into standby mode.

- 1 Press MENU to display the main menu.
- 2 Select "FEATURES" with △+ or ∇- and press CK. The FEATURES menu appears.

To switch off the timer Select "OFF" in step 3.

To check the remaining time Press (3).

Select "SLEEP TIMER" with ∆+ or ∇- and press OK. (See Fig. 19.)

The time period option changes colour.

Select the time period with △+ or ∇−. The time period changes as follows: OFF → 0:30 → 1:00 → 1:30 → 2:00

5 After selecting the time period, press OK. The cursor moves back to the left margin and the timer starts counting. One minute before the TV switches into standby mode, a message is displayed on the screen.

6 Press MENU to return to TV picture.

FEATURES 🔀

If you try to select a

programme that has

the blank TV screen.

been blocked

The message LOCKED appears on

#### **PARENTAL LOCK**

You can prevent undesirable broadcasts from appearing on the screen. We suggest you use this function to prevent children from watching programmes which you consider unsuitable.

- Select the TV programme which you want to block.
- 2 Press MENU to display the main menu.
- 3 Select "FEATURES" with △+ or ∇- and press OK. The FEATURES menu appears.
- 4 Select "PARENTAL LOCK" with Δ+ or ∇- and press OK.
- 5 Select "ON" with  $\Delta +$  or  $\nabla -$  and press OK. (See Fig. 20.)
- 6 Press MENU to return to TV picture.

#### Cancelling PARENTAL LOCK

- 1 On the PARENTAL LOCK menu, select "OFF" with  $\Delta +$  or  $\nabla -$ .
- 2 Press OK.

PEATURES
-SUPERTIMEN: OFF
PARENTALLOCK: OFF
PHOTO
MOEX
SELECT 11 AND PRESS (THE

FEATURES
SLEEP TIMER: OFF
PRAEHTAL LOCK: ON
PHOTO
INDEX

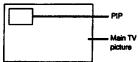
Fig. 20

SELECT IL AND PRESS ON

Fig. 19

Note
RGB input source
cannot be displayed in
PIP.

With this function you can display a "PIP screen" (small picture) within the main TV picture. In this way you can watch or monitor the video output from any connected equipment (for example from a VTR) while watching TV or vice versa. For information about connection of other equipment, refer to page 22.



#### Switching PIP on and off

Press (3).

The PIP screen will be displayed. The PIP picture will come from the source chosen when the TV was last used.

To Switch PIP off Press (3 again.

#### Selecting a PIP source

- Press t.
- The symbol it will be displayed at the bottom, left-hand corner of the screen.
- Press repeatedly until the desired PIP source is indicated (e.g. TV, AV1, AV2, YC2, AV3, YC3, AV4, YC4).

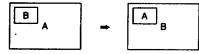
#### Note

If no video source has been connected, the PIP picture will be noisy.

#### Swapping screens

Press 🗷.

The main screen will switch the picture with the PIP screen.



#### Notes

- If a TV programme is on the PIP screen and a video source on the main picture, and you want to change channels, first press t and then the programme number buttons or PROGR +/-.
- Swapping screens takes about 2 seconds after pressing (2).
- After swapping screens if the colour systems of the main and PIP pictures are different, the PIP picture first appears in black and white and then in colour.

#### Changing the position of the PIP

Press ® repeatedly to change the position of the PIP screen within the main screen. There are four different positions available.



-10-

**Teletext** 

0000

0000 0000 0000 0000

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**6'6'6**0

000

•

Teletext errors may

signals are weak.

the Remote

broadcasts Fastext signals.

occur if the broadcasting

With the simple side of

You can switch teletex

on and off, operate

Fastest, and directly

select page numbers.

Fastext operation is only

possible, if the TV station

0

#### **EATURES** (A)

# 9,8,00

#### Displaying Frame-by-frame Pictures (PHOTO)

- 1 Press MENU to display the main menu.
- Select "FEATURES" with  $\Delta +$  or  $\nabla -$  and press OK. The FEATURES menu appears. (See Fig. 21.)
- Select "PHOTO" with ∆+ or ∇- and press OK. (See Fig. 22.) The preset programme is displayed in nine separated screen in sequence. (See Fig. 23.)

To restore the normal picture Press OK and MENU.



Fig. 21

PEATURES SLEEP TIMEN: OFF PARENTAL LOCK: OFF PHOTO ROCK	
SELECT II AND PRESS	OK)

Fig. 22



# Fig. 23

#### **Checking Ali the Preset Programmes (INDEX)**

- 1 Press MENU to display the main menu.
- 2 Select "FEATURES" with Δ+ or ∇- and press OK. The FEATURES menu appears. (See Fig. 24.)
- 3 Select "INDEX" with ∆+ or ∇- and press OK. (See Fig. 25.) The nine preset programmes appear in the separated screen in sequence, switching the picture for each seconds. After all the nine programmes are displayed, each sequence switch the picture with the sound for each five seconds. Press  $\Delta$ + also switches to the next nine programmes. (See Fig. 26.)

To restore the normal picture Press OK and MENU.

MENU
PICTURE
BOURD
FEATURES
CONVERGENCE
PRESET SELECT II AND PRESS OF

Fig. 24

	FEATURES BLEEF TIMER: OFF PARENTAL LOCK: OFF PHOTO MOEX
1	SELECT TI AND PRESS DE

Fig. 25

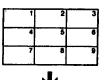




Fig. 26

TV stations broadcast an information service called Teletext via the TV channels. Teletext service allows you to receive various information pages such as weather reports or news at any time you want. For advanced teletext operation, use the buttons on the Full-Function side of the Remote Commander.

#### **Direct Access Functions**

#### Switching Teletext on and off

- Select the TV channel which carries the teletext broadcast you want to watch.
- 2 Press @ to switch on teletext.

A teletext page will be displayed (usually the index page). If there is no teletext broadcast, "No text available" is displayed on the information line at the top of the screen.

To switch teletext off

Press O.

#### Selecting a teletext page

With direct page selection

Use the number buttons to input the three digits of the chosen page number.

If you have made a mistake, type in any three digits. Then re-enter the correct page number.

If the requested page is not available at that moment, a message will be disolated.

#### Accessing next or preceding page

Press (PAGE+) or (PAGE-). The next or preceding page appears.

Superimposing the teletext display on the TV programme

- Press @ once in teletext mode or twice in TV mode.
- Press @ again to resume normal teletext reception.

#### Preventing a teletext page from being updated

- Press @ (HOLD). The HOLD symbol "®" is displayed on the information line.
- Press to resume normal teletext reception.

#### **Using Fastext**

With Fastext you can access pages with one key stroke. When a Fastext page is broadcast, a colour-coded menu will appear at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue buttons on the Remote Commander.

Press the corresponding coloured button on the Remote Commender which corresponds to the colour-coded menu. The page will be displayed after a few seconds.

## 

Note Some of the features may not be available depending on the teletext service.

#### **Using the Teletext Menu**

This TV is provided with a menu-guided teletext system. When teletext is switched on, you can use the menu buttons to operate the teletext menu. Select the teletext menu functions in the following way:

- 1 Press MENU. The menu will be superimposed on the teletext display. (See Fig. 27.)
- Using △+ or ∇-, select the teletext function you want and press OK.

#### INDEX

The index will give you an overview of the contents of the teletext and the page numbers.

#### **ENLARGING**

For convenient reading of a teletext page, you can enlarge the teletext display with the ability to acroll up and down. After having selected the function, an information line TOP/BOTTOM/FULL will be displayed. (See Fig. 28.)

To enlarge the upper half with "TOP", select "TOP" and hold down the  $\nabla$ -. To enlarge the lower half with "BOTTOM," select "BOTTOM" and held down the  $\Delta$ +. The picture can be scrolled up to 2 steps in each direction. Press OK for "FULL" to resume the normal size.

Press @ to resume normal teletext reception.

#### **TEXT CLEAR**

After selecting the function, you can watch a TV programme while waiting for a teletext page to be displayed. (See Fig. 29.)

Press ® to resume normal teletext reception.

#### **SUBTITLES**

Your teletext service will inform you if a TV programme is subtities.

After having selected the function the subtities will be displayed.

#### REVEAL

Sometimes pages contain concealed information, such as answers to a quiz. The REVEAL option lets you disclose the information. After having selected the function, concealed information will be displayed.

By choosing REVEAL again on the menu, the concealed information will be canceled.

Press @ to resume normal teletext reception.

TELETEXT MENU
PRODEX
BULLAR
BULLAR
BULLER
REVEAL
TIME PAGE
BULLER
BULLER
BULLER
BULLER
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BULLER
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Flg. 27

▲TOP \* SOTTOM (DE) PULL

Fig. 28



Fig. 29

#### TIME PAGE

Press OK to select

OFF for the TIME

To cancel the request

Select SUBPAGE and

"TIME PAGE" and

"SUBPAGE" testures

may not be available

depending on the teletext service.

press OK.

the request.

PAGE setting to cancel

Your teletext service will inform you, if a time coded page is available. You may have a page (a.g. an alarm page) displayed at a certain time.

- Using △+ or ∇-, select "ON." Press OK.
   The TV programme you were watching before you selected TIME PAGE is restored.

   An information window will be displayed at the bottom of the page.
- To select the desired page, enter three digits for the page number (e.g.452) using the number buttons and press OK.
- 3 To select the desired time, enter four digits for the desired time (e.g. 1800) using the number buttons and press OK. The selected time is displayed at the top in the left-hand corner. At the requested time, the page will be displayed. Press @ to resume normal teletent mode.

#### SUBPAGE

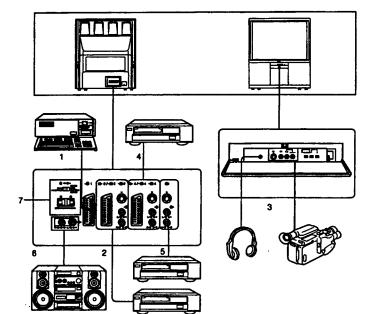
You may want to select a particular teletext page from several subpages which are rotated automatically. After having selected the function, an information line will be displayed.

To select the desired subpage, enter four digits using PROGR \*/or the number buttons (e.g. enter 0002 for the second page of a sequence).

# **Connecting and Operating Optional Equipment**

#### **Connecting Optional Equipment**

You can connect optional audio-video equipment to this TV such as a VCR, video disc player, and stereo system.



To connect a VCR using the 'T terminal Connect the serial output of the VCR to the serial terminal T of the TV.

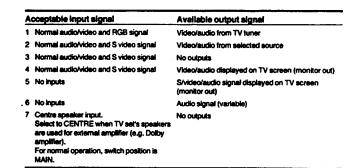
We recommend that you time in the video signal.

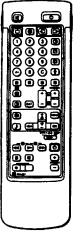
We recommend that you tune in the video signal to programme number "0." For details see "Preset channels manually" on page 9.

If the picture or the sound is distorted Move the VCR away from the TV.

S/video Input (Y/C input) Video signals may be separated into Y (luminance or brightness) and C (chrominence) signals Separating the Y and C signals prevents them from interfering with one another, and therefore improves picture quality (especially luminance) This TV is equipped with 3 S Video input jecks through which these separated signals can be input directly.

When connecting a moneural VCR Connect only the white - jack to both the TV and VCR.





T connector always outputs the audio and video signels from the 'If serial terminals.

CS-4/-E94 connector shways outputs the audio and video signals which you are currently watching on the TV screen (i.e. monitor output).

#### **Selecting Input**

This section explains how to view the video input picture (of the video source connected to your TV).

Press - repeatedly to select the input source.

The symbol of the selected input source will appear. (See Fig. 30.) To go back to the normal TV picture

Press O.



Symbol	Input signal	
- <b>Đ</b> 1	Audio/video input through the -⊚1 connector	
Ð	Audio/RGB input through the - 1 connector	
-Đ2	Audio/video input through the @+2/ - \$2 connector	
<b>-6</b> 02	Audio/S video input through the @+2/ -@2 or -@2 connector (4-pin connector)	
-Đ3	Audio/video input through -⊕3 and -⊕3 on the front	
<b>-6</b> 03	Audio/S video input through the -®3 (4-gin connector) and -€3 connectors	
-Đ4	Audio/video input through the G+4/ -€04 connector	
<b>-€</b> 04	Audia/S video input through the @+4 / -@4 or -@4 connector(4-pin connector)	

#### Selecting Output from the @-2/- \$2 Connector

You can select the output signal from the @-2/-E82 connector. The @-2/-E82 connector outputs the input signals from the other connectors as indicated below.

Press G- repeatedly to select the output.

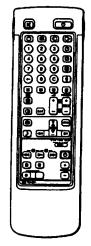
The symbol of the selected output source appears. (See Fig. 31.)



Symbol	Output signal of the @-2/-@2 connector				
1 G+	Audio/video signal from the@1 connector				
2 🕒	Audio/video signal from the @-2/1@2 connector				
2 ∰-	Audio/S video signal from the @-2/-@2 or -@2 connector (4 pin)				
3 🕒	Audio/video signal from the -€3, -€3 connectors				
3 ∰-	Audio/S video signal from the -€3, -⊙3 connectors				
4 G+	Audio/video signal from the G+4/ € 4 connector				
4 (B+	Audio/S video signal from the ⊕-4/®4 or®4 connector (4 pin)				
τvG•	Audio/video signal from the 'T' aerial terminal				

## For Your Information

**Optimum Viewing Area** 



When recording When you use the #
{record} button, make sure to press this button and the one to the right of it simultaneously.

## Remote Control of Other Sony Equipment

You can use the TV Remote Commander to control most of Sony remote-controlled video equipment such as: beta, 8 mm and VHS VCRs and video disc players.

Tuning the Remote Commander to the equipment

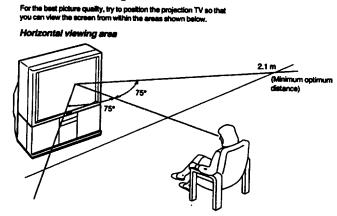
Set the VTR 1/2/3 MDP selector according to the equipment you want to control:

VTR 1: Beta VCR VTR 2: 8 mm VCR VTR 3: VHS VCR MDP: Video disc player

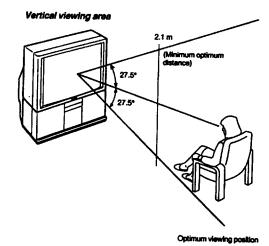
 Use the buttons indicated in the Illustration to operate the additional equipment.

If your video equipment is furnished with a COMMAND MODE selector, set this selector to the same position as the VTR 1/2/3 MDP selector on the TV Remote Commander.

If the equipment does not have a certain function, the corresponding button on the Remote Commander will not operate.



Optimum viewing position

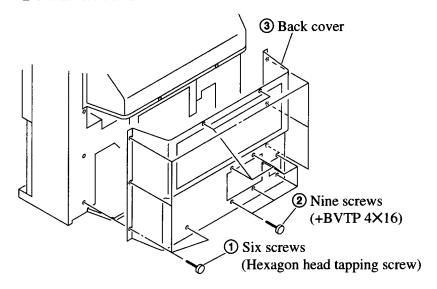


24

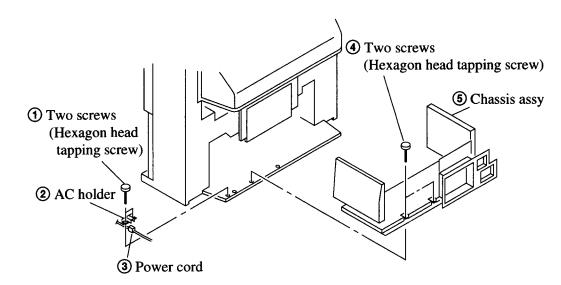
GB

## SECTION 2 DISASSEMBLY

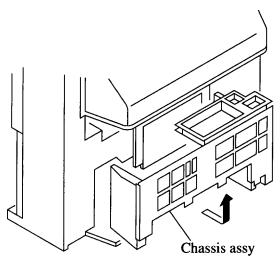
#### 2-1-1. BACK COVER REMOVAL



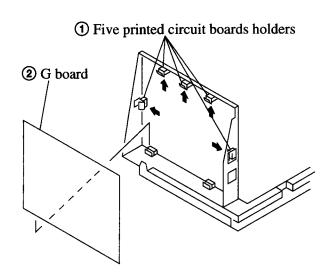
2-1-2. CHASSIS ASSY REMOVAL



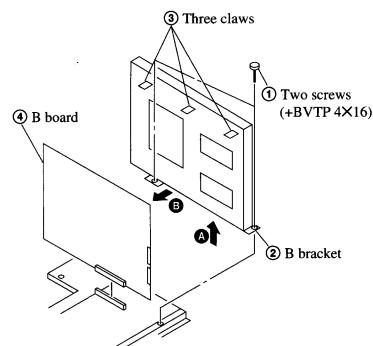
#### 2-1-3. SERVICE POSITION



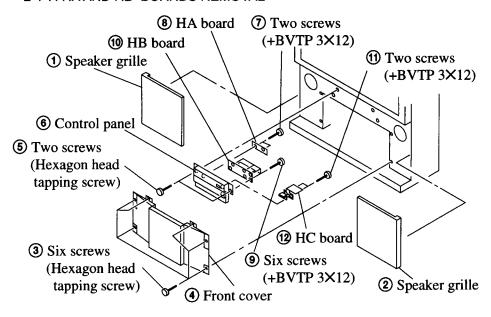
2-1-4. G BOARD REMOVAL



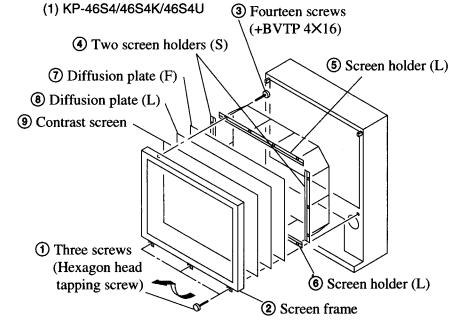
#### 2-1-6, B BOARD REMOVAL



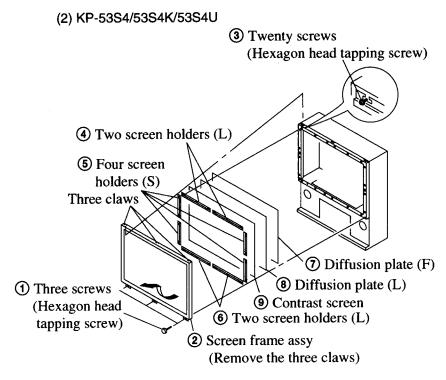
#### 2-1-7. HA AND HB BOARDS REMOVAL



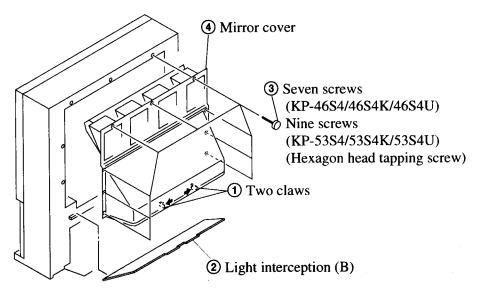




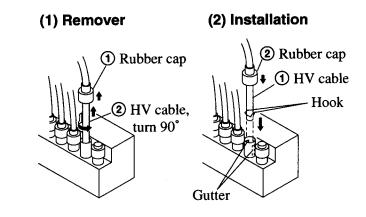
- 16 -



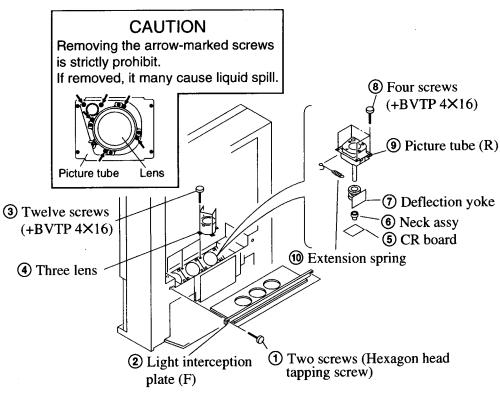
#### 2-1-9. MIRROR COVER ASSY REMOVAL



#### 2-1-10. HIGH-VOLTAGE CABLE INSTALLATION AND REMOVAL

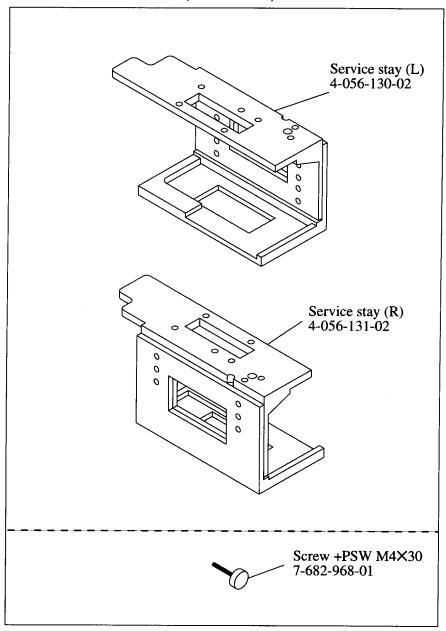


2-1-11. PICTURE TUBE REMOVAL

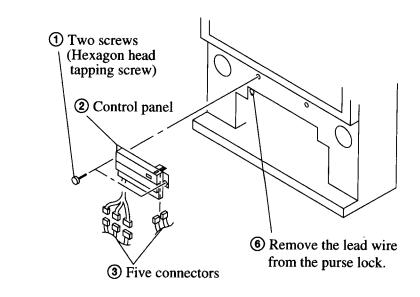


#### 2-2.SERVICE STAY ASSY HOW TO USE AND CARRY BACK SERVICE STAY ASSY

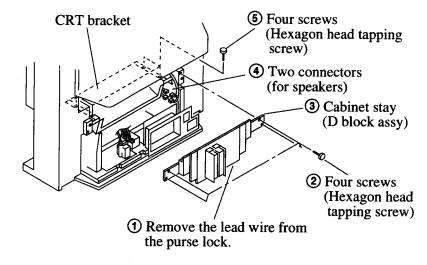
2-2-1. SERVICE STAY ASSY (X-4034-033-2)

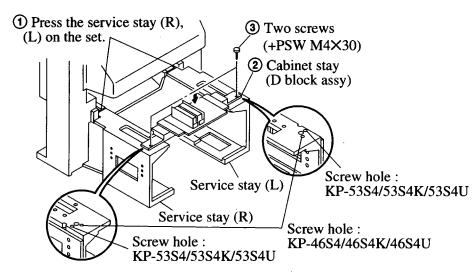


2-2-2.CONTROL PANEL REMOVAL



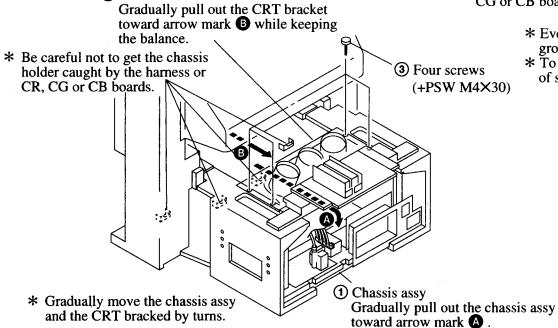
2-2-3. CABINET REMOVAL

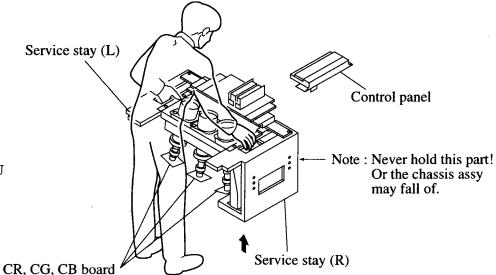




#### 2-2-5. INSTALL A CHASSIS ASSY

(2) CRT bracket





\* When carrying the chassis assy, be careful not to touch the CR, CG or CB boards with your legs.

\* Even with 2 servicemen, be sure to put your hands into the grooves on the top of service stays (L) and (R) to carry the chassis assy.

\* To hold the chassis assy, put your hands into the grooves on the top of service stays (L) and (R).

# SECTION 3 SET-UP ADJUSTMENTS

	OLI OI AL	DOO IMENIO		
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SCREEN VOLTAGE ADJUSTMENT (ROUGH ALIGNMENT)				
<ol> <li>Turn the red VR on the FOCUS block all the way to the left and then gradually turn it to the right until the point where you can see the retrace line.</li> <li>Next gradually turn it to the left to the position where the retrace line disappears.</li> <li>FOCUS LENS ADJUSTMENT</li> </ol>	Monoscope Pattern		PICTUREminimum BRIGHTNESS50% SCREEN (G2)	B G B FOCUS
Loosen the lens screw.				FOCUS block
<ol> <li>Set in service mode.</li> <li>Use VSP on the service mode menu to show only the green colour.</li> <li>Press the Commander Menu button and select FEATURES and CONVERGENCE to display the test signal on the screen.</li> <li>Rotate the green lens and align with the optimal focus point from the test signal.</li> <li>Use RRH from the service mode menu to set to green and red.</li> <li>Disply the test signal and rotate the red lens to obtain the optimum focus at the point where the red and green spots overlap.</li> <li>Use RBH from the service mode menu to set to red and blue.</li> <li>Disply the test signal and rotate the blue lens to obtain the optimum focus at the point where the blue and red spots overlap.</li> </ol>				CONVERGENCE
10. Tighten the lens screw.				
<ol> <li>SCREEN (G2) ADJUSTMENT</li> <li>Select VIDEO mode without signals.</li> <li>Connect an oscilloscope to the TP7103(KR), TP7203(KG) and TP7303(KB) of CR board, CG board and CB board.</li> <li>Adjust R to 172±2Vdc         <ul> <li>G to 170±2Vdc</li> <li>B to 164±1Vdc</li> <li>by rotating screen VR on the focus block.</li> </ul> </li> </ol>				172 ± 2Vdc (R) 170 ± 2Vdc (G) 164 ± 1Vdc (B)  GND

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
FOCUS VR ADJUSTMENT		-		<b>←→</b>
<ol> <li>Set in service mode.</li> <li>Use VSP on the service mode menu to show only the green colour.</li> <li>Press the Commander Menu button (convergence) and output the test signal.</li> <li>Rotate the green VR on the FOCUS block and align to obtain the optimal focus point.</li> <li>Use RRH from the service mode menu to set to green and red.</li> <li>Disply the test signal and rotate the red VR to obtain the optimum focus at the point where the red and green spots overlap.</li> <li>Use RBH from the service mode menu to set to red and blue.</li> <li>Disply the test signal and rotate the blue VR aligning to obtain the optimum focus at the point where the blue and green spots overlap.</li> </ol>				Lens Scanning line visible.  Minimize both A and B.
<ol> <li>DEFLECTION YOKE TILT ADJUSTMENT</li> <li>Set in service mode.</li> <li>Set to receive the monoscope signal.</li> <li>Use VSP on the service mode menu to show only the green colour.</li> <li>Loosen the deflection yoke set screw and align the tilt of the deflection yoke so that the bars at the centre of the monoscope pattern are horizontal.</li> <li>After aligning the deflection yoke, fasten it securely to the funnel-shaped portion (neck) of the CRT.</li> <li>The tilt of the deflection yoke for red is aligned with RRH on the service mode menu, and the tilt on the deflection yoke for blue is aligned with RBH on the service menu, is aligned the same as was done for green.</li> </ol>	Monoscope pattern		·	2-pole magnet  Deflection yoke  Neck Assy  Anode cap

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
2-POLE MAGNET ADJUSTMENT				
<ol> <li>Set in service mode.</li> <li>Set to receive the dot pattern signal.</li> <li>Place the caps on the red and blue lens so that only the green colour is showing.</li> <li>Turn the green VR on the focus block to the right and set to overfocus to enlarge the spot.</li> <li>Now align the 2-Pole Magnet so that the enlarged spot is in the center of the Just Focus spot.</li> <li>Align the green focus VR and set for just (precise) focus.</li> <li>Perform the same alignment for red and blue.</li> </ol>	Dot pattern		2-pole magnet	Use the center dot
<ol> <li>4-POLE MAGNET ADJUSTMENT</li> <li>Set in service mode.</li> <li>Set to receive the dot pattern signal.</li> <li>Place the caps on the red and blue lens so that only the green colour is showing.</li> <li>Turn the green VR on the focus block to the left and set to underfocus to enlarge the spot.</li> <li>Now align the 4-Pole Magnet so that the enlarged spot becomes a perfect circle.</li> </ol>	Dot pattern		4-pole magnet	Use the center dot $x: y = 1:2$
<ol> <li>Receive the crosshatch signal.</li> <li>Adjust the FOCUS knob so that the crosshatch pattern vertical line width is as in the figure on the right.</li> <li>Blue only defocus Adjustment.</li> </ol>	Crosshatch pattern		FOCUS VR • RED • GREEN • BLUE	• Focus adjustment point  a: b=1:4  46": 10-12mm 53": 13-16mm without flare

#### **ELECTRICAL ADJUSTMENT BY REMOTE COMMANDER**

By using Remote Commander (RM-831), all circuit adjustments can be made.

#### **NOTE: Test Equipment Required.**

- 1. Pattern Generator
- 2. Frequency counter
- 3. Digital multimeter
- 4. Audio oscillator

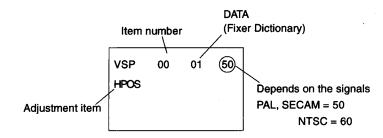
#### 1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

#### SERVICE MODE PROCEDURE

1. Standby mode. (Power off)

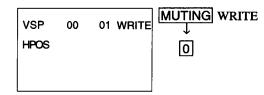
2. 
$$\boxed{\text{DISPLAY}} \rightarrow \boxed{5} \rightarrow \boxed{\text{VOL}(+)} \rightarrow \boxed{\text{TV POWER}}$$
 on the Remote Commander. (Press each button within a second.)

#### SERVICE MODE ADJUSTMENT



- 3. The CRT displays the item being adjusted.
- 4. Press 1 or 4 on the Remote Commander to select the item.
- 5. Press 3 or 6 on the Remote Commander to change the data.
- 6. If you want to recover the latest values press 7 then 0 to read the memory.
- 7. Press MUTING then 0 to write into memory.

#### SERVICE ADJUSTMENT MODE MEMORY



- 8. Press 8 then 0 on the Remote Commander to initialize.
- 9. Turn set off and on to exit.

#### 2. AFTER IC401 (NON VOLATILE MEMORY) REPLACEMENT

- 1. Enter to Service Mode.
- 2. Press 5 and 0 of the commander to initialize data.
- 3. Adjust standard data to call each item number with 3 and 6 of the commander. Write the data per each item number (MUTING + 0)
- 4. Select CP2 items menu and respectively set the data with 3 and 6 of the commander.

	Item number	Adjustment item	AEP	UK	K (OIRT)
CP2	03	B/G	1	1	1
	04	I	1	1	1
	05	IRE	0	1	0
	06	D/K	1	0	1
	07	AUS	0	0	0
	08	L	1	1	1

Press MUTING + 0 of the commander to write the data.

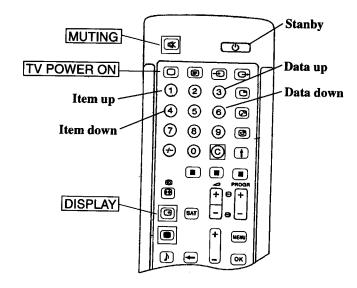
5. Select item CSET of TXT menu and set the data with 3 and 6 of the commander.

TXT	14	CSET	3: West (AEP/UK), 5: EAST(K)
			6: GREEK

Press MUTING + 0 of the commander to write the data.

6. Press 8 and 0 of the commander to make the user control data standard.

## 3. ADJUST BUTTONS AND INDICATOR



RM-831

### 4. SERVICE MODE LIST

#### VSP

	Item number	Adjustment item	Data range	Initial data	Note	Device
VSP	00	HPOS	0~63	51	H-SHIFT	CXD2018Q
	01	VSIZ	0~63	24	V-SIZE	3123130
	02	VPOS	0~63	24	V-SHIFT	
	03	vsco	0~15	8	S-CORRECTION	
	04	VLIN	0~15	10	V-LINEARITY	
	05	HSIZ	0~63	19	H-SIZE	
	06	HIPN	0~63	38	PIN-AMP	
	07	HKEY	0~31	9	TILT	
	08	UPCP	0~15	7	UPPER CORNER PIN	
	09	LOCP	0~15	10	LOWER CORNER PIN	
	10	HBOW	0~15	7	V-BOW	
	11	HSKE	0~15	9	V-ANGLE	

#### DΡ

	Item number	Adjustmen item	Data range	Initia data	Moto	Device
R GH	00	CENT	-127 ~ +128	20	GREEN. H CENTER	CXP85112B-613S
	01	SKEW	-127 ~ +128	0	GREEN. H SKEW	0130
	02	BOW	-127 ~ +128	0	GREEN. H BOW	
	03	4BOW	-127 ~ +128	0	GREEN. H 4th BOW	
İ	04	SIZE	-127 ~ +128	0	GREEN. H SIZE	
ĺ	05	LIN	-127 ~ +128	7	GREEN. H LINEARITY	
	06	MSIZ	-127 ~ +128	5	GREEN. H MIDDLE SIZE	
	07	MLIN	-127 ~ +128	-1	GREEN. H MIDDLE LINEARIT	Y
	08	KEY	-127~+128	0	GREEN. H KEY	
	09	SSKW	-127 ~ +128	0	GREEN. H SUB SKEW	1
	10	MPIN	-127 ~ +128	30	GREEN. H MIDDLE PIN	
	11	PIN	-127~+128	0	GREEN. H PIN	
	12	SBOW	-127~+128	0	GREEN. H SUB BOW	
	13	MBOW	-127 ~ +128	0	GREEN. H MIDDLE BOW	
	14	4PIN	-127 ~ +128	-3	GREEN. H 4th PIN	
	15	4SBOW	-127 ~ +128	0	GREEN. H 4th SUB BOW	
R GV	00	CENT	-127~+128	0	GREEN. V CENTER	CXP85112B-613S
	01	SKEW	-127 ~ +128	0	GREEN. V SKEW	CAL 05112B-0155
	02	BOW	-127 ~ +128	2	GREEN. V BOW	
	03	SIZE	-127 ~ +128	0	GREEN, V SIZE	1
	04	LIN	-127 ~ +128	4	GREEN, V LINEARITY	
	05	MSIZ	-127 ~ +128	0	GREEN. V MIDDLE SIZE	
	06	MKEY	-127 <b>~ +</b> 128	0	GREEN. V MIDDLE KEY	
	07	KEY	-127~+128	10	GREEN. V KEY	ĺ
	08	SSKW	-127~+128	0	GREEN. V SUB SKEW	
	09	MPIN	-127 ~ +128	25	GREEN. V MIDDLE PIN	
	10	PIN	-127 ~ +128	-20	GREEN. V PIN	
	11	SBOW	-127 ~ +128	-2	GREEN. V SUB BOW	
	12	WAVE	-127 ~ +128	0	GREEN. V WAVE	
_	13	4PIN	-127 ~ +128	10	GREEN. V 4th PIN	
R RH	00	CENT	-127 ~ +128	-30	RED. H CENTER	CXP85112B-613S
	01	SKEW	-127 ~ +128	0	RED. H SKEW	
	02	BOW	-127 ~ +128	0	RED. H BOW	
	03	4BOW	-127 ~ +128	0	RED. H 4th BOW	
	04	SIZE	-127 ~ +128	0	RED. H SIZE	J
ŀ	05	LIN	-127 ~ +128	-10	RED. H LINEARITY	1
	06	MSIZ	-127 ~ +128	-5	RED. H MIDDLE SIZE	1
	07	MLIN	-127 ~ +128	-5	RED. H MIDDLE LINEARITY	f
- 1	08	KEY	-127 ~ +128	-5	RED. H KEY	}
	09		-127 ~ +128	0	RED. H SUB SKEW	ł
	10	MPIN	-127 ~ +128	30	RED. H MIDDLE PIN	
	11	PIN	-127 ~ +128	10	RED. H PIN	

**- 24 -**

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ı

	Item number	Adjustment item	Data range	Initial data	Note	Device
RRH	12	SBOW	-127 ~ +128	30	RED. H SUB BOW	CXP85112B-613
	13	MBOW	-127 ~ +128	3	RED. H MIDDLE BOW	
	14	4PIN	-127 ~ +128	-3	RED. H 4th PIN	
	15	4SBOW	-127 ~ +128	-2	RED. H 4th SUB BOW	1
R RV	00	CENT	-127 ~ +128	10	RED. V CENTER	CXP85112B-613
	01	SKEW	-127 ~ +128	0	RED. V SKEW	
	02	BOW	-127 ~ +128	2	RED. V BOW	
	03	SIZE	-127~+128	0	RED. V SIZE	
	04	LIN	-127 ~ +128	0	RED. V LINEARITY	
	05	MSIZ	-127 ~ <b>+128</b>	0	RED. V MIDDLE SIZE	
	06	MKEY	-127 ~ +128	10	RED. V MIDDLE KEY	
	07	KEY	-127 ~ +128	10	RED. V KEY	
	08	SSKW	-127~+128	0	RED. V SUB SKEW	
	09	MPIN	-127 ~ <b>+</b> 128	25	RED. V MIDDLE PIN	
	10	PIN	-127 ~ +128	5	RED. V PIN	
	11	SBOW	-127 ~ +128	-2	RED. V SUB BOW	
	12	WAVE	-127 ~ +128	15	RED. V WAVE	
	13	4PIN	-127 ~ +128	10	RED. V 4th PIN	
R BH	00	BSEL	0/1	0	RESISTRATION µ CON BSEL	CXP85112B-613
	01	CENT	-127~+128	30	BLUE, H CENTER	,
	02	SKEW	-127 <b>~ +</b> 128	0	BLUE. H SKEW	
	03	BOW	-127 ~ +128	0	BLUE. H BOW	
	04	4BOW	-127 ~ +128	0	BLUE. H 4th BOW	
	05	SIZE	-127 ~ +128	-1	BLUE, H SIZE	
	06	LIN	-127 ~ +128	-10	BLUE. H LINEARITY	
	07	MSIZ	-127 ~ +128	<b>-</b> 5	BLUE, H MIDDLE SIZE	
	08	MLIN	-127 ~ +128	5	BLUE, H MIDDLE LINEARTIY	
	09	KEY	-127 ~ +128	0	BLUE, H KEY	
	10	SSKW	-127 ~ +128	0	BLUE, H SUB SKEW	
	11	MPIN	-127 ~ +128	30	BLUE, H MIDDLE PIN	
	12	PIN	-127 ~ +128	0	BLUE. H PIN	
	13	SBOW	-127 ~ +128	-30	BLUE. H SUB BOW	
	14	MBOW	-127 ~ +128	-3	BLUE. H MIDDLE BOW	
	15	4PIN	-127 ~ +128	-3	BLUE, H 4th PIN	
	16	4SBOW	-127 ~ +128	2	BLUE, H 4th SUB BOW	
R BV	00	CENT	-127 ~ +128	0	BLUE. V CENTER	CXP85112B-613
	01	SKEW	-127 ~ +128	0	BLUE, V SKEW	
	02	BOW	-127 ~ +128	2	BLUE, V BOW	
	03	SIZE	-127~+128	-10	BLUE. V SIZE	
	04	LIN	-127 ~ +128	0	BLUE, V LINEARITY	
1	05	MSIZ	-127 ~ +128	0	BLUE, V MIDDLE SIZE	
	06	MKEY	-127 ~ +128	-10	BLUE, V MIDDLE KEY	

	Item number	Adjustment item	Data range	Initial data	Note	Device
R BV	07	KEY	-127 ~ +128	0	BLUE. V KEY	CXP85112B-613S
	08	SSKW	-127 ~ +128	0	BLUE, V SUB SKEW	
	09	MPIN	-127 ~ +128	25	BLUE, V MIDDLE PIN	
	10	PIN	-127 ~ +128	0	BLUE, V PIN	
	11	SBOW	-127 ~ +128	10	BLUE. V SUB BOW	
	12	WAVE	-127 ~ +128	-15	BLUE, V 3th WAVE	
	13	4PIN	-127 ~ +128	10	BLUE. V 4th PIN	

### D/A

	Item number	Adjustment item	Data range	Initial data	Note	Device
D/A	00	BKU	0 ~ 63	63	V.BLK UP-SIDE	CXA1315PM
	01	BKD	0~63	0	V.BLK DOWN-SIDE	

### MCD

	Item number	Adjustment item	Data range	Initial data	Note	Device
MCD	00	MHUE	0~31	15	SUB HUE OF MAIN PICTURE	TDA9141
	01	YDLT	0~15	7	Y DELAY	TDA9143
					i	

## SCD

	Item number	Adjustment item	Data range	Initial data	Note	Device
SCD	00	SHUE	0~31	15	SUB HUE OF SUB PICTURE	TDA9160

## RGB

	Item number	Adjustment item	Data range	Initial data	Note	Device
RGB	00	SCOL	0~15	4	SUB COLOUR	TDA4780
	01	SBRT	0~63	27	SUB BRIGHT	
	02	RAMP	0 ~ 63	31	RED GAIN	
	03	GAMP	0~63	31	GREEN GAIN	
	04	BAMP	0~63	31	BLUE GAIN	
	05	RCUT	0~63	31	RED LEVEL REFERENCE	
	06	GCUT	0~63	31	GREEN LEVEL REFERENCE	
	07	BCUT	0~63	31	BLUE LEVEL REFERENCE	
	08	PDL	0~63	31	PEAK DRIVE LIMITER	
	09	GNMA	0 ~ 63	0	GAMMA	
	10	ADBL	0/1	0	ADAPTIVE BLACK	
	11	RELC	0/1	1	RELATIVE TO CUT-OFF	
	12	TCPL	0/1	1	TIME CONSTANT PEAK	
					DRIVE LIMITER	

	Item number	Adjustment item	Data range	Initial data	Note	Device
PIP	00	RDV	0~15	8	V READ DELAY	SDA9188-3X
	01	RDH	0~63	16	H READ DELAY	
	02	FRY	0~15	3	BRIGHTNESS OF THE BORDER FRAME	
	03	9V50	0~7	. 3	MULTI PIP V 50Hz	]
1	04	9H50	0~7	2	MULTI PIP H 50Hz	
	05	9V60	0~7	2	MULTI PIP V 60Hz	
	06	9H60	0~7	3	MULTI PIP H 60Hz	
	07	SCON	0~15	8	CONTRAST D/A CONVERTER	

## IPQ

	Item number	Adjustment item	Data range	Initial data	Note	Device
IPQ	00	CIN	0/1	0	CINE MODE (ABAB RASTER) OFF/ON	83C652
	01	107	0/1	1	MEMORY CONFIGURATION	
	1				TMS4C2972 SWITCH	
	02	LFR	0/1	1	LINE FLICKER REDUCTION	
	:				MODE OFF/ON	
	03	HWE	0~15	15	HWE I LINE DEALY OFF SET TO	
					DEFAULT	
	04	NR	0~3	2	NOISE REDUCTION LEVEL	
	05	Y-V	0~255	60	Y-VALUE (BRIGHTNESS)	
	06	UV-V	0~255	0	UV-VALUE (COLOUR)	
	07	PEAK	0~127	10	PEAKING	
	08	СП	0~127	64	CTI LEVEL DATA	
	09	VWE	0~63	31	VWEI DELAY	

## TXT

	Item number	Adjustment item	Data range	Initial data	Note	Device
TXT	00	TXH	0~255	9	H START POSITION	TPU3040/TPU3041
	01	TXV	0~63	44	V START POSITION	
	02	VSP	0~255	59	V STOP POSITION	
	03	BSP	0~255	61	BLANKING STOP	
	04	BST	0~255	53	BLANKING START	
	05	QSF	0~31	1	ACQUSITION SOFT SLICER	
	06	A7F	0~255	10	VALUE OF ADRESS 007FH	
	07	QDT	0~63	13	ACQUSITION DATA SLICER	
	08	CST	0~255	0	CLAMPING START	
	09	CSP	0~255	80	CLAMPING STOP	
	10	LMT	0/1	0	LIMIT SLICER ADAPTION SW	
	11	GMX	0~255	31	GAIN MAX	
	12	FMX	0~255	31	FILTER MAX	
	13	TVER	0~3	3	TPU VERSION (TC2023)	
	14	CSET	0~7	3	TELETEXT LANGUAGE SETTING 3: WEST (AEP/UK) 5: EAST (K), 6: GREEK	

### AP

	Item number	Adjustment item	Data range	Initial data	Note	Device
AP	00	FAW	0~255	10	NICAM FAW THRESHOLD	MSP3410
	01	СТМ	0~255	4	NICAM ERROR BIT THRESHOLD(MONONICAM)	
	02	CŢN	0~255	80	NICAM ERROR BIT THRESHOLD(NICAM>MONO)	
	03	WGO	0~255	10	WEST GERMAN STEREO LOW THRESHOLD	
	04	WGS	0~255	21	WEST GERMAN STEREO HIGH THRESHOLD	
	05	WGT	0~255	80	WEST GERMAN STEREO LOW 2 THRESHOLD	
	06	WGB	0~255	250	WEST GERMAN STEREO HIGH 2 THRESHOLD	
ŀ	07	ACG	0/1	1	AGC AUTO / CONSTANT SWITCH	
	08	CDB	0~63	30	AGC GAIN VALUE AT CONSTANT MODE	
	09	FMP	0~127	26	FM MONO PRESCALE	
	10	WGP	0~127	26	WEST GERMAN STEREO PRESCALE	
	11	INIP	0~127	127	I NICAM PRESCALE	
	12	BNIP	0~127	72	B/G NICAM PRESCALE	
	13	LNIP	0~127	81	L NICAM PRESCALE	
	14	DNIP	0~127	72	D/K NICAM PRESCALE	
	15	CRM	0/1	0	CARRIER MUTE FUNCTION	
	16	ACO	0/1	1	AUDIO CLOCK OUT OFF/ON	
	17	WAC	0~15	1	WEST GERMAN STEREO JUDGE CONSTANT	

### CPU

	Item number	Adjustment item	Data range	Initial data	Note	Device
CPU	00	OSH	0~63	18	OSD H POSITION	CXP85460
	01	ODL	0~256	15	POWER ON DELAY	
	02	FTZP	0/1	1	FIZ MUTE PRIORITY	
	03	RGBP	0/1	0	RGB MODE PRIORITY	
	04	NICP	0/1	1	NICAM PRIORITY	
	05	B/G	0/1	1	TV SYSTEM B/G OFF/ON	
	06	I	0/1	1	TV SYSTEM I OFF/ON	
	07	IRE	0/1	0	TV SYSTEM IRE OFF/ON	
	08	D/K	0/1	1	TV SYSTEM D/K OFF/ON	
	09	AUS	0/1	0	TV SYSTEM AUS OFF/ON	
	10	L	0/1	1	TV SYSTEM L OFF/ON	
	11	MYC 2	0/1	0	YC2/AV2 PRIORITY	
	12	MYC 4	0/1	0	YC4/AV4 PRIORITY	1

## IP 2

	Item number	Adjustment item	Data range	Initial data	Note	Device
IP2	00 01 02 03 04	BOX SCF SPS PHAS AXIS	0/1 0~3 0~3 0/1 0/1	0 0 0 0	BOX FUNCTION SWITCH SCREEN FADE FUNCTION SPLIT SCREEN FUNCTION PHASE FLAG RGB AXIS	TDA9160
	05 06 07 08	HSFT SFTE SFTF 3BCN	0~31 0/1 0/1 0~255	10 1 0 10	H. SHIFT ADJUSTMENT PICTURE SHIFT ENABLE PICTURE SHIFT FACTORY CHECK BINARY BIT CHECK FOR TELETEXT	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
CONVERGENCE ADJUSTMENT				
●When replacing the deflection yoke, always perform "DEFLECTION YOKE TILT ADJUSTMENT" before adjusting the convergence.				
Adjustment procedure  VSP MAIN  R GH (SUB), R GV (SUB)  R RH (SUB), R RV (SUB)  R BH (SUB), R BV (SUB)				
GREEN REGISTRATION ADJUSTMENT     V-SHIFT adjustment	Monoscope pattern or Crosshatch		<vsp menu=""> VSP VPOS</vsp>	vpos •
V-LINEARITY adjustment	pattern		VSP VLIN	VLIN • • • • • • • • • • • • • • • • • • •
V-SIZE, V-CORRECTION adjustment     While tracking, adjust so that the lattice intervals for VSIZ and     VSCO are equal.			VSP VSIZ VSP VSCO	VSIZ  VSCO  VSCO  VSCO  VSCO

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
H-SHIFT adjustment			VSP HPOS	HPOS +
H-SIZE adjustment     Finely adjust with SUB MSIZ.			VSP HSIZ	HSIZ •
PIN-AMP adjustment     Finely adjust with SUB MPIN.			VSP HPIN	HPIN → ((())))
• UPPER/LOWER-CORNER PIN adjustment Correct the screens top and bottom bow line. However, if this adjustment is overdone, distortion may occur with the PIN-AMP adjustment that can not be re-adjusted.			VSP UPCP VSP LOCP	UPCP →
Note: The PIN-AMP adjusts the overall screen from top to bottom, but the UPPER/LOWER-CORNER PIN adjustments have large movement in the top and bottom sections, so be careful.				LOCP -
V-ANGLE, V-BOW adjustment     Correct the tilt and bow of the vertical line at the center of the screen.			VSP HSKE VSP HBOW	HSKE -
				HBOW ← (())
• TILT adjustment Adjust to eliminate the tilt of one of the two vertical lines at both ends of the screen.			VSP HKEY	HKEY

ADJUSTMENT ITEM AND PROCEDURE								EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
CONVERGENCE SUB ADJUSTMENT											
				i iai Ci	41						
Adjustme	ent O: Yes	-: N									
Display	Adjustment item	рси	PGV	RRH	nent typ		RBV				
BSEL	COL SELECT	-	-	- KKII	-	0	-				
CENT	CENT	0	0	0	o	0	0				
SKEW	SKEW	0	0	0	0	0	0				
BOW	BOW	0	0	0	0	0	0				
4BOW	4TH BOW	0	_	0	_	0	-				
SIZE	SIZE	0	О	0	О	0	0				
LIN	LIN	0	0	0	0	0	0				
MSIZ	MID SIZE	0	0	0	0	0	0				
MLIN	MID LIN	0	0	0	_	0	-				
MKEY	MID KEY	_	0	_	0	_	0				
KEY	KEY	0	0	0	0	0	0				
SSKW	SUB SKEW	0	0	0	0	0	0				
M PIN	MID PIN	0	0	0	0	0	0				
PIN	PIN	0	0	0	0	0	0				
SBOW	SUB BOW	0	0	0	0	0	0				
WAVE	WAVE	_	0		0		0				
MBOW	MID BOW	0	_	0		0	_				
4PIN	4TH PIN	0	0	0	0	0	0				
4SBOW	4TH SUB BOW	0		0		0	-				

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN SUB ADJUSTMENT  SCREEN CENTER SECTION GREEN VERTICAL LINE  ADJUSTMENT  1. Finely adjust with RGH CENT, RGH BOW, RGH SKEW.  Adjust by watching out for the RGH CENT screen center section.			<rgh menu=""> RGH CENT RGH BOW RGH SKEW</rgh>	Watch out only for the GH CENT center point.  Watch the vertical center line.
2. RGH 4TH BOW adjustment Correct the corner distortion that could not be adjusted away with the RGH 4BOW adjustment.			RGH 4BOW	RGH CENT  RGH BOW  RGH SKEW  RGH 4BOW  RGH 4BOW

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SCREEN CENTER SECTION GREEN HORIZONTAL LINE			<rgv menu=""></rgv>	
ADJUSTMENT				
Finely adjust the center position of the vertical line at the center of the screen with RGV CENT.			RGV CENT	Watch the horizontal center line.  Watch out only for the RGV CENT center point.
				RGV CENT
				*
2. Correct the tilt and bow of the horizontal line at the center of			RGV SKEW	RGV SKEW
the screen with RGV SKEW and RGV BOW.			RGV BOW	+ -
				RGV BOW
GREEN SIZE AND LINEARITY ADJUSTMENT			<rgh menu=""></rgh>	1
Balance the sizes at both sides of the center section of the screen with RGH MLIN.      Balance the sizes on both end sections of the screen with RGH LIN.			RGH MLIN RGH LIN	— — — — — — — — — — — — — — — — — — —
<ol> <li>While tracking, adjust with RGH MLIN and RGH LIN so that the sizes of the horizontal line at the center of the screen are symmetrical left and right.</li> </ol>				- LIN

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<ol> <li>GREEN HORIZONTAL SIZE ADJUSTMENT</li> <li>Adjust with RGH MSIZE so that the sizes of both ends and of both sides of the center section of the screen are equal.</li> <li>Adjust with RGH SIZE so that the horizontal sizes of both ends and of both sides of the center section of the screen are equal.</li> <li>While tracking, adjust with RGH MSIZ and RGH SIZE so that the lattice intervals for the horizontal line section of the center section of the screen are equal and so that the horizontal size is the prescribed value.</li> <li>If M LIN is changed when the RGH MSIZ and RGH SIZE adjustment is complete, adjust again while tracking.</li> </ol>			<rgh menu=""> RGH MSIZ RGH SIZE</rgh>	MSIZ SIZE  GH MLIN  GH MSIZ  GH MSIZ  GH LIN
<ul> <li>With just the H SIZE adjustment in MAIN, if there is no need to adjust RGH SIZE in SUB this can save power.</li> <li>GREEN VERTICAL LINEARITY ADJUSTMENT</li> <li>1. Adjust RGV LIN so that the vertical lines at the top and bottom of the screen are symmetrical.</li> </ul>			<rgv menu=""> RGV LIN</rgv>	GH SIZE

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<ol> <li>GREEN VERTICAL SIZE ADJUSTMENT</li> <li>Adjust with RGV MSIZE so that the sizes for the top and bottom sections of the screen and for both sides of the center section of the screen are equal.</li> <li>Set the vertical size to the prescribed value with RGV SIZE.</li> <li>Adjust RGV MSIZ and RGV SIZE watching the vertical line at the center section of the screen.</li> <li>While tracking, adjust with RGV MSIZ and RGV SIZE so that the lattice intervals for the vertical line section of the center section of the screen are equal and so that the vertical size is the regulation value.</li> <li>If RGV LIN is out of place when the RGV MSIZ and RGV SIZE adjustment is complete, adjust again while tracking.</li> <li>If there is no need to adjust RGV SIZE in SUB with just the V SIZE adjustment in MAIN, this can save power.</li> </ol>			<rgv menu=""> RGV MSIZ  RGV SIZE</rgv>	MSIZ SIZE GV LIN GV SIZE GV MSIZ
<ol> <li>GREEN HORIZONTAL TRAPEZOIDAL DISTORTION</li> <li>ADJUSTMENT</li> <li>Adjust with RGH SSKW so that the tilt of the vertical lines at both ends of the screen is symmetrical left and right.</li> <li>Adjust with RGH KEY so that there is no tilt in the vertical lines at both ends of the screen.</li> <li>If there is a tilt on either the left or right after the RGH KEY adjustment, adjust while tracking.</li> </ol>			<rgv menu=""> RGH SSKW RGH KEY</rgv>	SS KW KEY

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL QUATERNARY ADJUSTMENT			<rgh menu=""></rgh>	
<ol> <li>Correct the quaternary distortion with RGH 4PIN.</li> <li>While balancing, correct the quaternary distortion of both end sections of the screen with RGH 4SBOW.</li> <li>While tracking, adjust with RGH 4PIN and RGH 4SBOW.</li> </ol>			RGH 4PIN RGH 4SBOW	4 PIN () 4SBOW
<ol> <li>GREEN HORIZONTAL ASYMMETRICAL PIN DISTORTION ADJUSTMENT         <ol> <li>Adjust with RGH MBOW so that the pin asymmetry at both sides of the center section of screen is symmetrical.</li> <li>Adjust with RGH SBOW so that the bow at both end sections of the screen is symmetrical left and right.</li> <li>While tracking, adjust with RGH MBOW and RGH SBOW so that the bow of vertical lines on the entire screen is symmetrical left and right.</li> </ol> </li> </ol>			<rgh menu=""> RGH MBOW RGH SBOW</rgh>	M BOW S BOW

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN HORIZONTAL SYMMETRICAL PIN DISTORTION			<rgh menu=""></rgh>	
ADJUSTMENT				
<ol> <li>Adjust the pin distortion at both sides of the center section of the screen with RGH MPIN.</li> <li>Adjust the pin distortion at both end sections of the screen with RGH PIN.</li> <li>While tracking, adjust with RGH MPIN and RGH PIN so that the PIN of vertical lines on the entire screen have no bowing.</li> <li>If there is asymmetrical pin distortion after the RGH MPIN and RGH PIN adjustments, adjust with RGH MBOW and RGH SBOW while tracking.</li> </ol>			RGH MPIN RGH PIN RGH MBOW RGH SBOW	M PIN ()
●With just the PIN AMP adjustment in MAIN, if there is no need to adjust RGV PIN in SUB, this can save power.				GH MBOW  GH SBOW  GH MPIN
GREEN VERTICAL WAVE (TERTIARY DISTORTION)			<rgv menu=""></rgv>	
ADJUSTMENT				
Take the screen top and bottom horizontal lines with RGV WAVE and find the secondary and quaternary waveform.			RGV WAVE	RGV WAVE
There is KEY distortion after the RGV WAVE adjustment, so adjust with RGV WAVE and RGV KEY while tracking.			RGV KEY	RGV KEY

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN VERTICAL QUATERNARY DISTORTION			<rgv menu=""></rgv>	
ADJUSTMENT				
Correct the quaternary distortion of the horizontal lines at the top and bottom sections of the screen with RGV 4PIN.			RGV 4PIN	RGV 4PIN
<ol> <li>Since there is no 4SBOW for vertical correction, there will be a slight imbalance, but adjust to eliminate the distortion from the horizontal line at either the top or the bottom of the screen.</li> <li>In many cases, the horizontal lines at the top and bottom sections of the screen are not straight lines after the adjustment. As long as the secondary distortion is mild enough that it can be corrected with the PIN adjustment, this is OK.</li> </ol>				
GREEN VERTICAL TRAPEZOIDAL DISTORTION			<rgv menu=""></rgv>	
ADJUSTMENT			RGV SSKW	RGV SSKW
<ol> <li>Adjust with RGV SSKW so that the tilt of the horizontal lines at the top and bottom sections of the screen is symmetrical about the center position horizontal line.</li> <li>Adjust with RGV MKEY so that there is no tilt for the line</li> </ol>			RGV MKEY	KUV SSKW
sections at both sides of the horizontal lines at the center section of the stream.  3. Adjust with RGV KEY so that there is no tilt for the horizontal lines at the top and bottom sections of the screen.  4. While tracking, adjust with RGV MKEY and RGV KEY so			RGV KEY	MKEY ( )
that there is no tilt for the horizontal lines on the entire screen.				KEY
5. If the tilt is unbalanced after the RGV MKEY and RGV KEY adjustment, adjust again with RGV SSKW.			RGV SSKW	GV SSKW  GV KEY  GV MKEY

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN VERTICAL ASYMMETRICAL PIN DISTORTION		·	<rgv menu=""></rgv>	
(SECONDARY DISTORTION) ADJUSTMENT				
Correct the asymmetrical pin distortion at the top and bottom sections of the screen with RGV SBOW.			RGV SBOW	RGV SBOW
GREEN VERTICAL ASYMMETRICAL PIN DISTORTION ADJUSTMENT			<rgv menu=""></rgv>	
<ol> <li>Adjust the pin distortion for both side sections and the center of the screen with RGV MPIN.</li> <li>Adjust with RGV PIN so that the horizontal lines at the top and bottom sections of the screen are straight lines.</li> <li>Adjust with RGV MPIN and RGV PIN so that there is no curve in the horizontal lines on the entire screen.</li> </ol>			RGV MPIN RGV PIN	MPIN () PIN
4. After the adjustments in Items 1-3, adjust the tracking with RGV SBOW, RGV MPIN, and RGV PIN.			RGV SBOW	GV SBOW  GV MPIN  GV PIN

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
GREEN AND RED REGISTRATION ADJUSTMENT				
(RRH, RRV)				
1. Receive a PAL cross-hatch signal.	PAL Cross-hatch			
2. Adjust so that the red lines lay on the green lines.	pattern			
Adjust with the same procedure as the GREEN SUB adjustment.				
Notes: 1. The main correction is not carried out during red registration adjustment.				
<ol><li>Beware. The green adjustment items can be changed by mistake.</li></ol>				
3. Unlike for green, adjust within the range -127 ~ +128.				
GREEN AND BLUE REGISTRATION ADJUSTMENT				
(RBH, RBV)	PAL Cross-hatch			
1. Receive a PAL cross-hatch signal.	nattern			
2. Adjust so that the blue and green lines are on top of each other.	F			
Notes: 1. The main correction is not carried out during RED				
registration adjustment.				
<ol><li>Beware. The GREEN and RED adjustment items can be changed by mistake.</li></ol>			·	
can be changed by mistake.				
	:			

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ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<ol> <li>AGC ADJUSTMENT</li> <li>Receive an off-air signal.</li> <li>Adjust the AGC VR (IF 1001) so that there is no snow noise and cross-modulation.</li> <li>WHITE BALANCE ADJUSTMENT</li> <li>Receive the monoscope pattern signal and adjust the picture quality with the menu.</li> <li>Adjust service mode SBRT so that the signal 10 IRE section barely glows.</li> <li>Receive the all-white pattern signal.</li> <li>Adjust the white balance with service mode GCUT and BCUT.</li> <li>Adjust service mode SBRT so that the signal 100 IRE section barely glows.</li> <li>Adjust the white balance with service mode GAMP and BAMP.</li> <li>Repeatedly adjust the white balance for the minimum and maximum picture settings.</li> </ol>	Monoscope pattern  All White pattern		PICTURE minimum < RGB MENU > RGB SBRT RGB GCUT RGB BCUT  PICTURE minimum RGB GAMP RGB BAMP PICTURE maximum	

# SECTION 4 SAFETY RELATED ADJUSTMENTS

HV HOLD DOWN CIRCUIT OPERATION CHECK AND ADJUSTMENT  When replacing the following components marked with ☑ on the schematic diagram, always check hold-down voltage and if necessary re-adjust.  OPERATION CHECK       Marked parts   R988	ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
CN4007. 5. Reconfirm operation check.	[ E BOARD ]  HV HOLD DOWN CIRCUIT OPERATION CHECK AND ADJUSTMENT  When replacing the following components marked with  on the schematic diagram, always check hold-down voltage and if necessary re-adjust.  OPERATION CHECK  1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block.  2. Connect a 68kΩ variable resistor, set to maximum value, across CN4006.  3. Power on the set.  4. Receive dot signal pattern.  5. Gradually lower the value of the variable resistor and check that the hold-down circuit operates at a static voltmeter reading of 33.40±0.30kVdc when the raster disappears.  HV HOLD-DOWN ADJUSTMENT  1. REPART STEPS ① ~ ⑤ as above.  2. Just at the point hold-down circuit begins to operate switch off the set.  3. Remove the VR connected across CN4006, and measure it's resistance.  4. Solder a resistor value, nearest to the measured value, across CN4007.	AND SIGNAL  HIGH-VOLTAGE Voltmeter	marked parts C4057, D4026, R988, R4019, T4002, T4003 (FBT), E BOARD, HV Block  HV Block  CN4006  HIGH-VOLTAGE Voltmeter	LOCATION	Remove the cap off from the unused terminal and connect a static voltmeter there.  CN4006  CN4006  CN4006

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
HV REGULATION CIRCUIT CHECK AND ADJUSTMENT  When replacing the following components marked with  on the schematic diagram always check HV regulation, and if necessary readjust.  OPERATION CHECK  1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block.  2. Power on the set.  3. Receive dot signal pattern.  4. Check that the HV static voltmeter is reading 31.00±0.2kVdc.  HV Regulation adjustment  1. Repeat step  as aboue.  2. Connect 68kΩ variable resistor, set to maximum value, to CN4006.  3. Power on the set.  4. Receive dot signal pattern.  5. Gradually lower the value of the variable resistor until the static voltmeter is reading 31.00±0.20kVdc.  6. Switch off the set.  7. Remove the VR connected across CN4006, and measure its value.  8. Solder a resistor value, nearest to the measured value, across CN4006.  9. Reconfirm operation check.	Dot pattern HIGH-VOLTAGE Voltmeter	Marked parts C4033, C4034, C4046, C4047, C4049, D4012, D4018, D4023, D4028, D4035, R983, R4022, R4046, R4047, R4048, R4053, R4054, R4057, R4059, R4060, R4061, R4077, R4079, R4086, R4087, R4088, R4091, R4092, R4097, R4098, R4100, Q4013, T4002, T4003 ( FBT ), E Board, HV Block HIGH-VOLTAGE Voltmeter 31.00 ± 0.20k Vdc CN4006	₩ R983	CN4006  CN4006  CN4006  CN4006  CN4006  CN4006  CN4006

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND NU	
HV HOLD DOWN ADJUSTMENT WITHOUT USING STATIC HIGH VOLTAGE METER				E BOARD	-COMPONENT SIDE-
It is normally desirable that HV hold down and HV regulation checks uses a high voltage meter. However, sometimes one is not available, for example in the held, below is an adjustment method that can be used.			■ R983, R988	©	001
<ol> <li>Receive DOT signal (PICTURE: 80%, BRIGHTNESS: 50%).</li> <li>Turn off the power of the projector, and remove ■R983 from CN4006 and ■R988 from CN4007.</li> <li>Fix a 47kΩ VR onto CN4006 with solder, and set the resistor value at maximum.</li> </ol>	Dot pattern		47kΩ VR maximum	CN4006  O O  CN4007	
<ul> <li>Fix a 68kΩ VR onto CN4007 with solder, and set the resistor value at minimum.</li> <li>4. Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin.</li> </ul>	Digital voltmeter	IC4001 <b>⑤</b> pin	68kΩ VR minimum		
<ul> <li>5. Slowly turn the 47kΩ VR that is soldered to CN4006, and gradually lower the voltage of IC4001 (5) pin down to 1.67Vdc.</li> <li>6. Slowly turn the 68kΩ VR that is soldered to CN4007, and gradually raise the resistor value until the raster disappears and the HV hold down circuit starts operating.</li> </ul>				CN4007	CN4006
<ul> <li>7. Turn off the power of the projector.</li> <li>8. Remove the 68kΩ VR from CN4007, and measure the resistor value with the digital voltmeter. Put a resistor ( metal oxide, 1/4W ) that has same value as the measured resistor onto CN4007 and solder it.</li> </ul>				68ΚΩ	47ΚΩ
<ol> <li>Set the value of the 47kΩ VR on CN4006 at the maximum.</li> <li>Receive DOT signal (PICTURE: 80%, BRIGHTNESS: 50%).</li> </ol>			PICTURE		
<ul> <li>10. Turn on the power of the projector.</li> <li>11. Connect a digital voltmeter to IC 4001 ⑤ pin.</li> <li>12. Slowly turn down the 47kΩ VR that is connected to CN4006 to gradually lower the voltage of IC4001 ⑤ pin between 1.62 to 1.70Vdc, and check if the raster disappears and the hold down circuit operates.</li> </ul>			BRIGHTNESSCENTER		
<ul> <li>13. Turn off the power of the projector.</li> <li>14. Remove the 47kΩ VR from CN4006. Put back the removed  ■ R983 onto CN4006 and solder it again.</li> </ul>					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
HV REGULATOR ADJUSTMENT WITHOUT USING STATIC HIGH VOLTAGEMETER ( MR983 )			<b>№</b> R983	E BOARD -COMPONENT SIDE-
<ol> <li>Receive DOT signal (PICTURE: 80%, BRIGHTNESS: 50%).</li> <li>Turn off the power of the projector.</li> <li>Remove ■R983 from CN4006.</li> </ol>	Dot signal		PICTURE80% BRIGHTNESS	
<ul> <li>4. Fix a 47kΩ VR onto CN4006 with solder, and set the resistor value at maximum.</li> <li>5. Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin.</li> </ul>	Digital voltmeter	IC4001 ⑤ pin	center	CN4006  O O  CN4007
<ul> <li>6. Slowly turn the 47kΩ VR that is soldered to CN4006, and gradually lower the voltage of IC4001 (a) pin down to 1.49Vdc.</li> <li>7. Turn off the power of the projector.</li> </ul>				2000
<ol> <li>Remove the 47kΩ VR from CN4006, and measure the resistor value with the digital voltmeter. Put a resistor ( metal oxide, 1/4W ) that has same value as the measured resistor onto CN4006 and solder it.</li> </ol>				CN4006
<ol> <li>9. Turn on the power of the projector. Check if the voltage of IC4001 (5) pin is between 1.46 and 1.53Vdc.</li> <li>10. Receive FULL WHITE signal ( PICTURE : 80%, BRIGHTNESS : 50% ).</li> <li>11. Turn off the power of the projector.</li> </ol>	Full white pattern		PICTURE80% BRIGHTNESS	47KΩ
[ G BOARD ]			center	G BOARD _ COMPONENT SIDE -
+B MAX VOLTAGE CONFIRMATION				R6054 ① ⑥
The following adjustments should always be performed when replacing IC6002 and R6054.  1. Supply 230VAC to with variable autotransformer.  2. Input monoscope signal.  3. Set the PICTURE control and the BRIGHTNESS controls to				IC6002
reset.  4. Confirm the voltage of G BOARD CN6014 ① pin connecter is less than 134.50 ± 1.00Vdc.  5. If step 4 is not satisfied, replace IC6002 and R6054 repeat		CN6014 ① pin		Voltage of CN6014 ① pin Less than 134.50 ±1.00Vdc
above steps.				

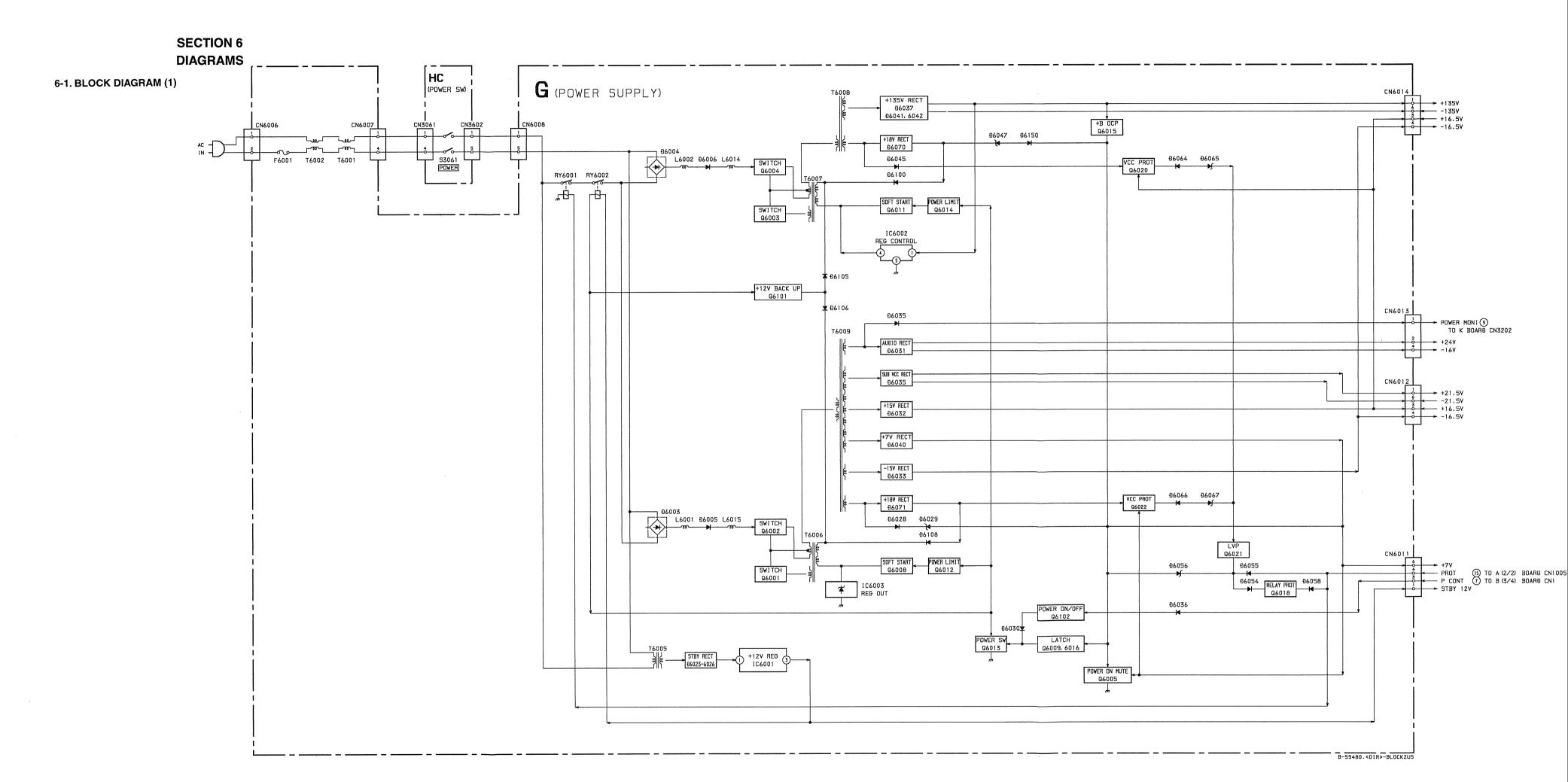
## SECTION 5 ELECTRICAL ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
B BOARD ADJUSTMENT  SUB COLOUR (SCOL) ADJUSTMENT  1. Input the PAL Colour Bar signal and adjustment the picture control.  2. Set to service mode.  3. Connect an oscilloscope between pin of IC409 and ground.  4. Adjust SCOL so that Vcy = VMg = VBi in the waveform levels.  5. Write the data to memory.	PAL Colour Bar pattern Oscilloscope	IC409 <b>②</b> pin (B(3/4) Board)	PICTURE 80% RGB SCOL: Vcy =VMg=VBi	<ic409 pin="" ②="">  Cy Mg Bi  W Vcy VMg VBi  63.5 μsec  <ic409 pin="" ②="">  Cy Mg Bi  Yw G R Bi  Bk</ic409></ic409>
SUB HUE (MHUE,SHUE) ADJUSTMENT  1. Input the NTSC Colour Bar signal. 2. Set to service mode. 3. Connect an oscilloscope between ② pin of IC409 and ground. 4. Adjust MHUE so that Vcy = VMg in the waveform levels. 5. Write the data to memory.	NTSC Colour Bar pattern Oscilloscope	IC409 <b>②</b> pin (B(3/4) Board)	MCD MHUE : Vcy =VMg	Vw Vcy VMg VBi 63.5 μsec (PIP MODE) < IC409 ② pin >
(PIP MODE)  1. Input the NTSC Colour Bar signal.  2. Select PIP on screen mode and put the set into service mode.  3. Connect an oscilloscope between  pin of IC409 and ground.  4. Adjust SHUE so that Vcy = VMg in the waveform levels.  5. Write the data to memory.	NTSC Colour Bar pattern Oscilloscope	IC409 <b>②</b> pin (B(3/4) Board)	SCD SHUE: Vcy =VMg	W Cy Mg Bi W Cy Mg Bi YW G R Bk YW G R Bk  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bi  YW G R Bk  Y
(PIP MODE)  1. Input the PAL Colour Bar signal.  2. Select PIP on screen mode and put the set into service mode.  3. Connect an oscilloscope Q1 emitter on the B(1/4) board and ground.  4. Adjust SCON so that V MAIN-Y = V PIP-Y in the waveform levels.  5. Write the data to memory.	PAL Colour Bar pattern Oscilloscope	Q1 emitter (B(1/4) Board)	PIP SCON: V main-y =V pip-y	SCHEEN SCHEEN 31.75 µsec  (PIP MODE)  < B(1/4) board - Q1 emitter >  White  V MAIN-Y V PIP-Y  Black Black PIP SCREEN

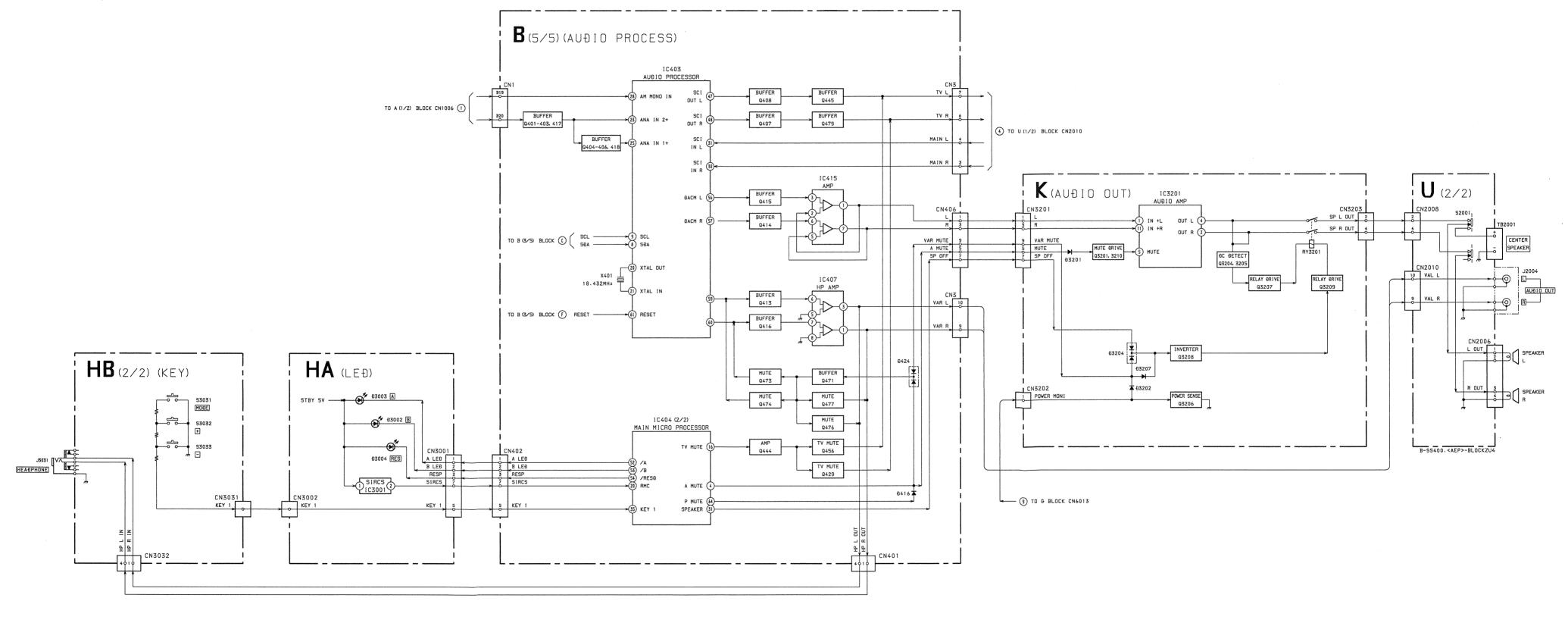
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
SUB WHITE BALANCE ADJUSTMENT				< Q2 emitter, Q7 emitter >
<ol> <li>(PIP MODE)</li> <li>Input Gray Scale signal 20 IRE.</li> <li>Select PIP in screen mode and put the set into service mode.</li> <li>Connect an oscilloscope Q2 emitter on the B(1/4) board and ground.</li> <li>Adjust RV1 so that V main = Vpip in the waveform levels.</li> <li>Connect an oscilloscope Q7 emitter on the B(1/4) board and ground.</li> <li>Adjust RV2 so that V main = Vpip in the waveform levels.</li> </ol>	Oscilloscope	[ B(1/4) Board ] Q2 emitter (R-Y) Q7 emitter (B-Y)	[ B(1/4) Board ] RV1 (R-Y) RV2 (B-Y)	- V 50(R-V)  - V 50(R-V)  - V 50(R-V)  - U 50(B-V)
P IN P POSITION ADJUSTMENT  1. Upon receiving the Monoscope signal. 2. Set service mode and then press the PIP command twice. The P in P positon will then move periodically to four points. Adjust "RDV" and "RDH" on the new screen so that the four points are distributed equally at; up, down, left and right.  3. Write the data to memory.	Monoscope pattern		< PIP MENU > RDV RDH	
1. Receive the RF signal with TEXT. 2. Set to service mode. 3. Set the TEXT in MIX mode and adjust the screen positon with "TXH" and "TXV". 4. Write the data to memory.			< TXT MENU > TXH (H position) TXV (V position)	
1. Receive the PAL Colour Bar signal. 2. Set to service mode. 3. Adjust "OSH" so that the center line of the signal and the center of the crosshairs of the OSD display match are aligned with each other. 4. Write the data to memory.	PAL Colour Bar pattern		< CPU MENU > OSH	

EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
			< IC3502 (5) pin waveform >
SECAM Colour Bar pattern	IC3502 <sup>(1)</sup> pin Q3508 emitter	L3503 L3505	GOOD BAD
			< Q3508 emitter waveform >
			GOOD
	RV3501		BAD ~
SECAM Colour Bar pattern		IC3501 1 pin	
	SECAM Colour Bar pattern  SECAM Colour Bar	SECAM Colour Bar pattern  IC3502 ⑤ pin Q3508 emitter  RV3501  SECAM Colour Bar	SECAM Colour Bar pattern  IC3502 (1) pin L3503  Q3508 emitter L3505  RV3501  SECAM Colour Bar

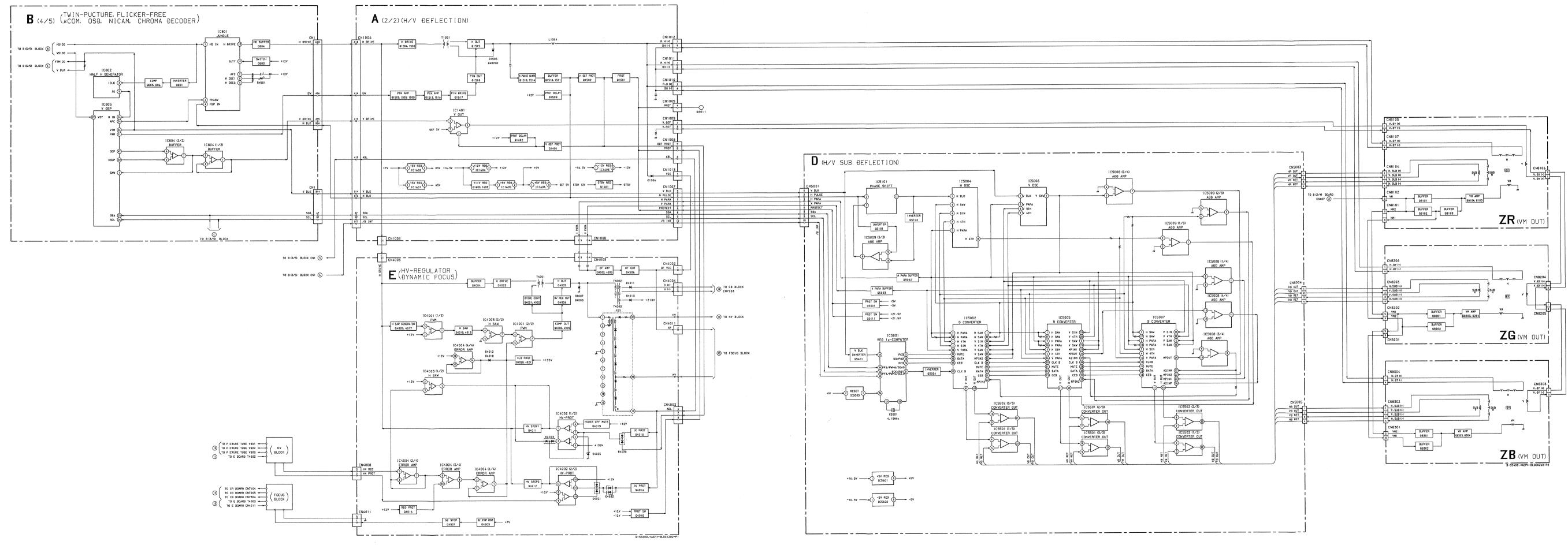
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
A BOARD ADJUSTMENT				
<ol> <li>V BLANKING SIZE ADJUSTMENT</li> <li>Receive PAL monoscope signal.</li> <li>Select "BKU" in D/A menu.</li> <li>Reduce the data value by pressing 3 and 6 on the commander to adjust blanking size and minimize the shear on the screen top.</li> <li>Select "BKD" in D/A menu.</li> </ol>	PAL Monoscoope pattern			
5. Increase the data value by pressing 3 and 6 on the commander to adjust blanking size and minimize the shear on the screen bottom.				
<ol> <li>H SIZE ADJUSTMENT</li> <li>Receive a PAL monoscope signal.</li> <li>Set to Service Mode.</li> <li>Select H SIZE of VSP menu with the commander buttons and 4.</li> <li>Adjust to 15.4 ± 0.2 square with 3 and 6.</li> </ol>	PAL Monoscoope pattern			
S CORRECTION ADJUSTMENT  1. Receive a PAL monoscope signal. 2. Set to Service Mode. 3. Select VSCO of VSP menu with the commander buttons 1 and 4. 4. Adjust to data "00" with 3 and 6.	PAL Monoscoope pattern			
<ol> <li>V SIZE ADJUSTMENT</li> <li>Receive a PAL monoscope signal.</li> <li>Set to Service Mode.</li> <li>Select V SIZE of VSP menu with the commander buttons and 4.</li> <li>Adjust to 11.6 ± 0.2 square with 3 and 6.</li> </ol>	PAL Monoscoope pattern			



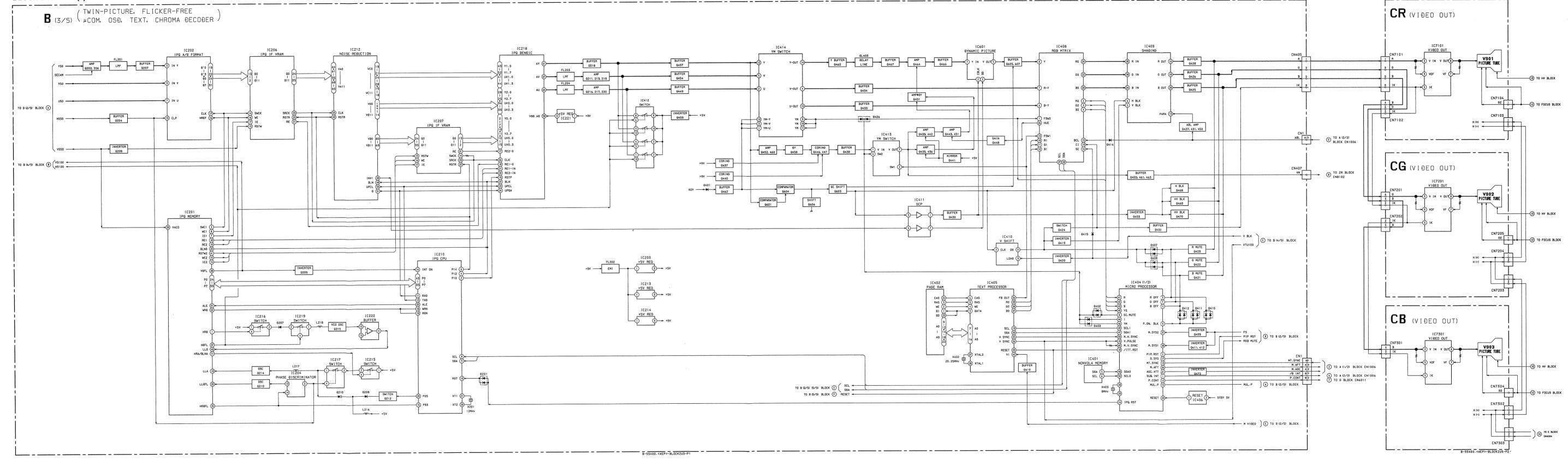
**BLOCK DIAGRAM (2)** 

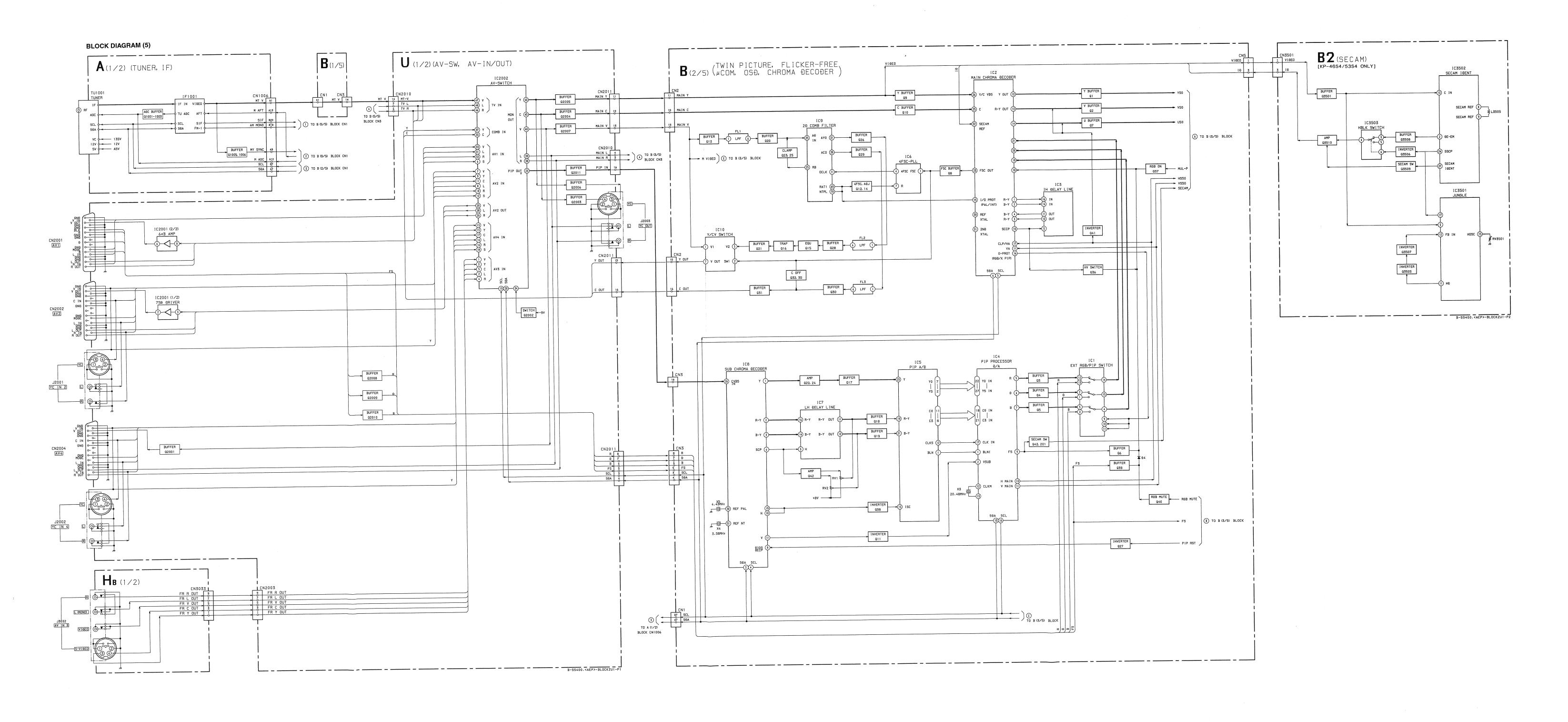


### **BLOCK DIAGRAM (3)**









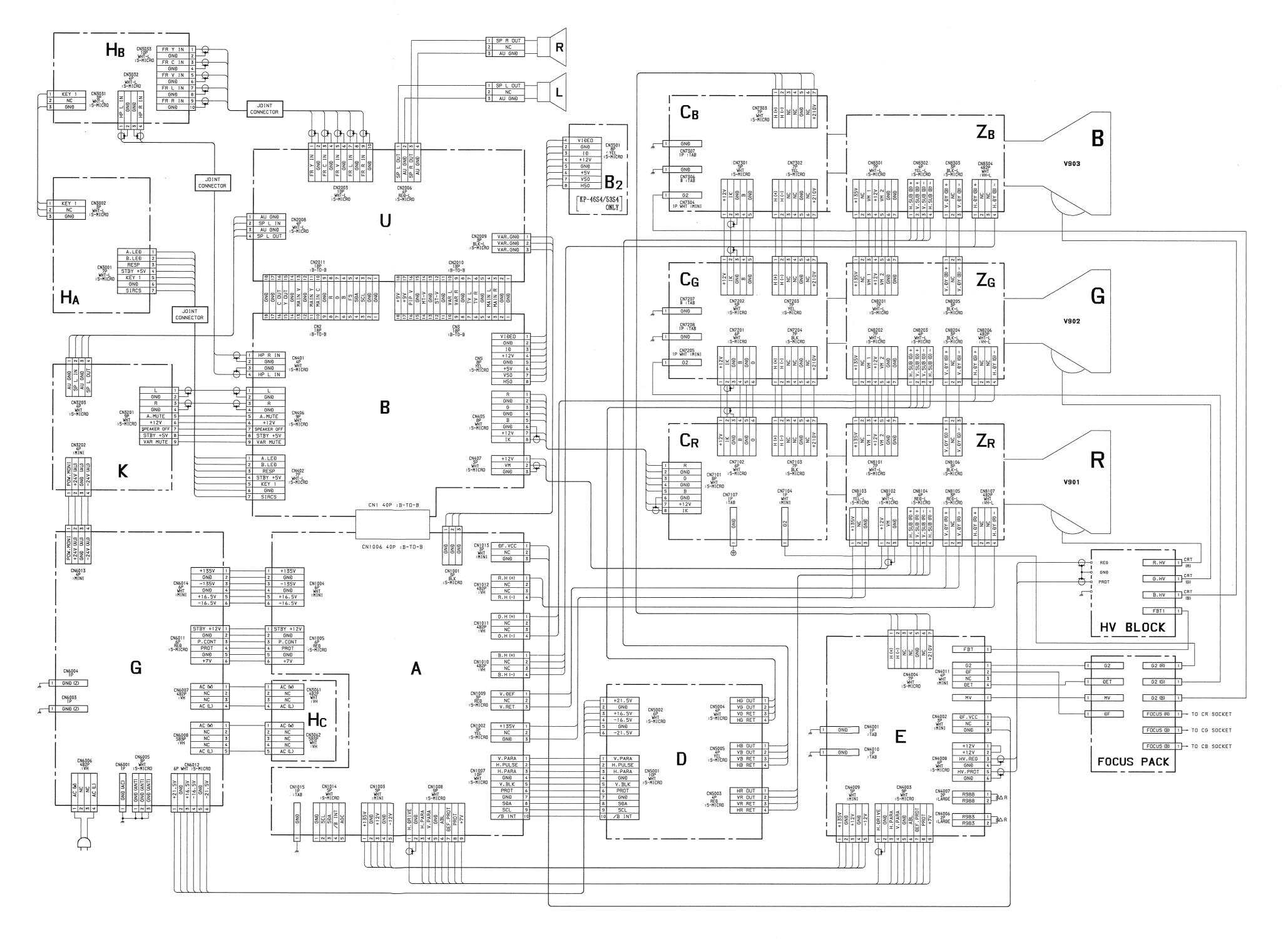
**- 63 -**

**- 64 -**

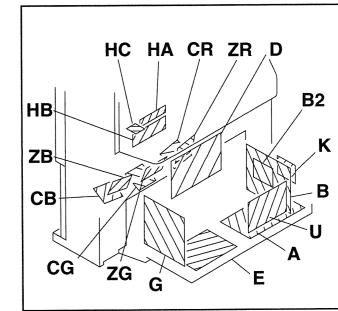
**– 66 –** 

**- 67 -**

**- 65 -**



### 6-3. CIRCUIT BOARDS LOCATION



## 6-4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

- Capacitors without voltage indication are all 50V
- All capacitors are in  $\mu F$  unless otherwise noted.
- All resistors are in ohms.

Pitch : 5mm

- $k\Omega$ =1000 $\Omega$ ,  $M\Omega$ =1000 $k\Omega$ · Indication of resistance, which dose not have one for rating electrical power, is as follows.
- Rating electrical power: 1/4 W
- 1/4W in resistance, 1/10W and 1/8W in chip resistance.
- : nonflammable resistor.
- tusible resistor.
- △ : internal component.
- All variable and adjustable resistors have characteristic curve B, unless otherwise
- بلر : earth-chassis.
- The components identified by in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding
- X-ray radiation. Should replacement be required, replace only with the value originally used.
- ullet When replacing components identified by  $oxedsymbol{\square}$  , make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by A and repeat the adjustment until the specified value is achieved.

Part replaced ( ☑ )	Adjustment ( )
C4057, D4026, R988, R4019, T4002, T4003 (FBT), E BOARD, HV BLOCK	HOLD-DOWN (R988)
C4033, C4034, C4046, C4047,C4049, D4012, D4018, D4023, D4028, D4035,R983, R4022, R4046, R4047, R4048, R4053, R4054, R4057, R4059, R4060, R4061, R4077, R4079, R4086, R4087, R4088, R4091, R4092, R4097, R4098, R4100, Q4013, T4002, T4003 (FBT), E Board, HV Block	HOLD-DOWN (R983)

- When replacing the part in below table, be sure to perfore Readings are taken with a color-bar signal input.
- no mark : PAL
- 〈 〉: SECAM
- ( ): NTSC 3.58
- Readings are taken with a  $10M\Omega$  digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V. \* : Measurement impossibillity.
- B+line.
   B-line.
  (Actual measured value may be different).
- 🗀 : signal path. Circled numbers are waveform references.

RESISTOR : RN METAL FILM

Reference information

: RC SOLID : FPRD NONFLAMMABLE CARBON

: FUSE NONFLAMMABLE FUSIBLE : RW NONFLAMMABLE WIREWOUND : RS NONFLAMMABLE METAL OXIDE

: RB NONFLAMMABLE CEMENT : X ADJUSTMENT RESISTOR

: LF-8L MICRO INDUCTOR CAPACITOR : TA TANTALUM : PS STYROL

: PP POLYPROPYLENE : PT MYLAR : MPS METALIZED POLYESTER

: MPP METALIZED POLYPROPYLENE : ALB BIPOLAR : ALT HIGH TEMPERATURE

: ALR HIGH RIPPLE

Note: The components identified by shading and mark riangle are critical for safety. Replace only with part number specified.

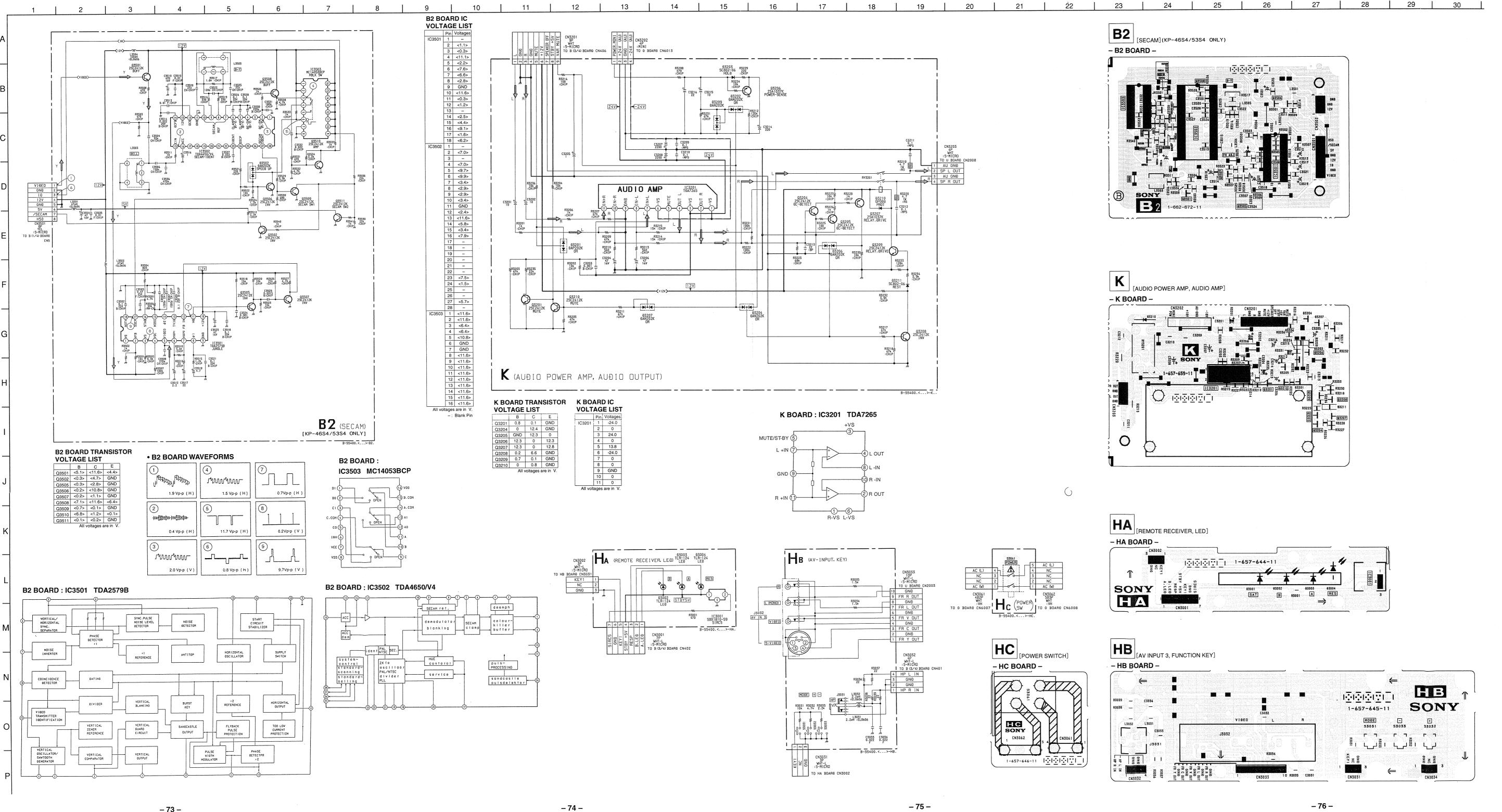
Note: The symbol display is on the component side. The components identified by shading and mark  $\Lambda$ are critical for safety. Replace only with part number

> The symbol indicate fast operating fuse. Replace only with fuse of same rating as maked.

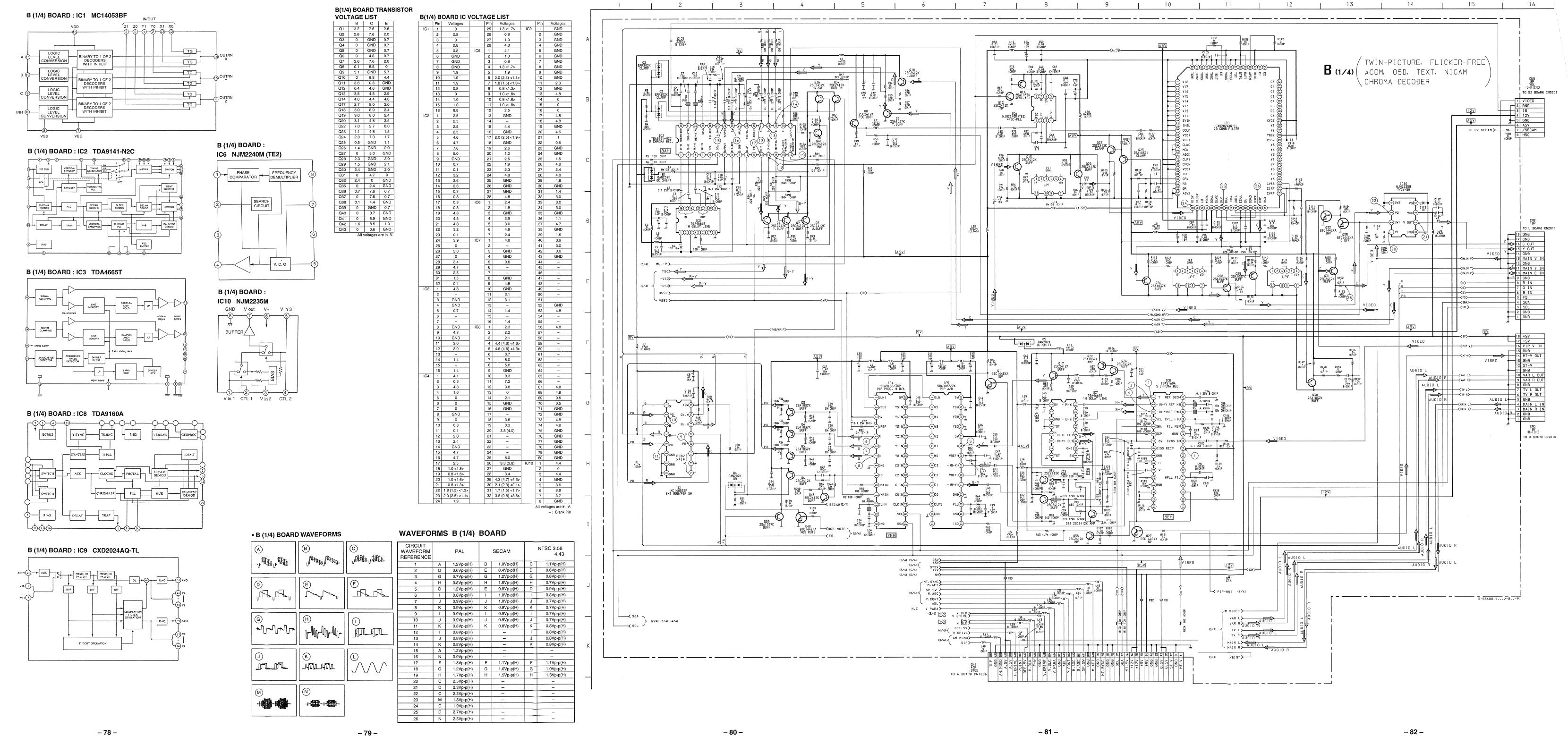
## Terminal name of semiconductors in silk screen printed circuit ( \* )

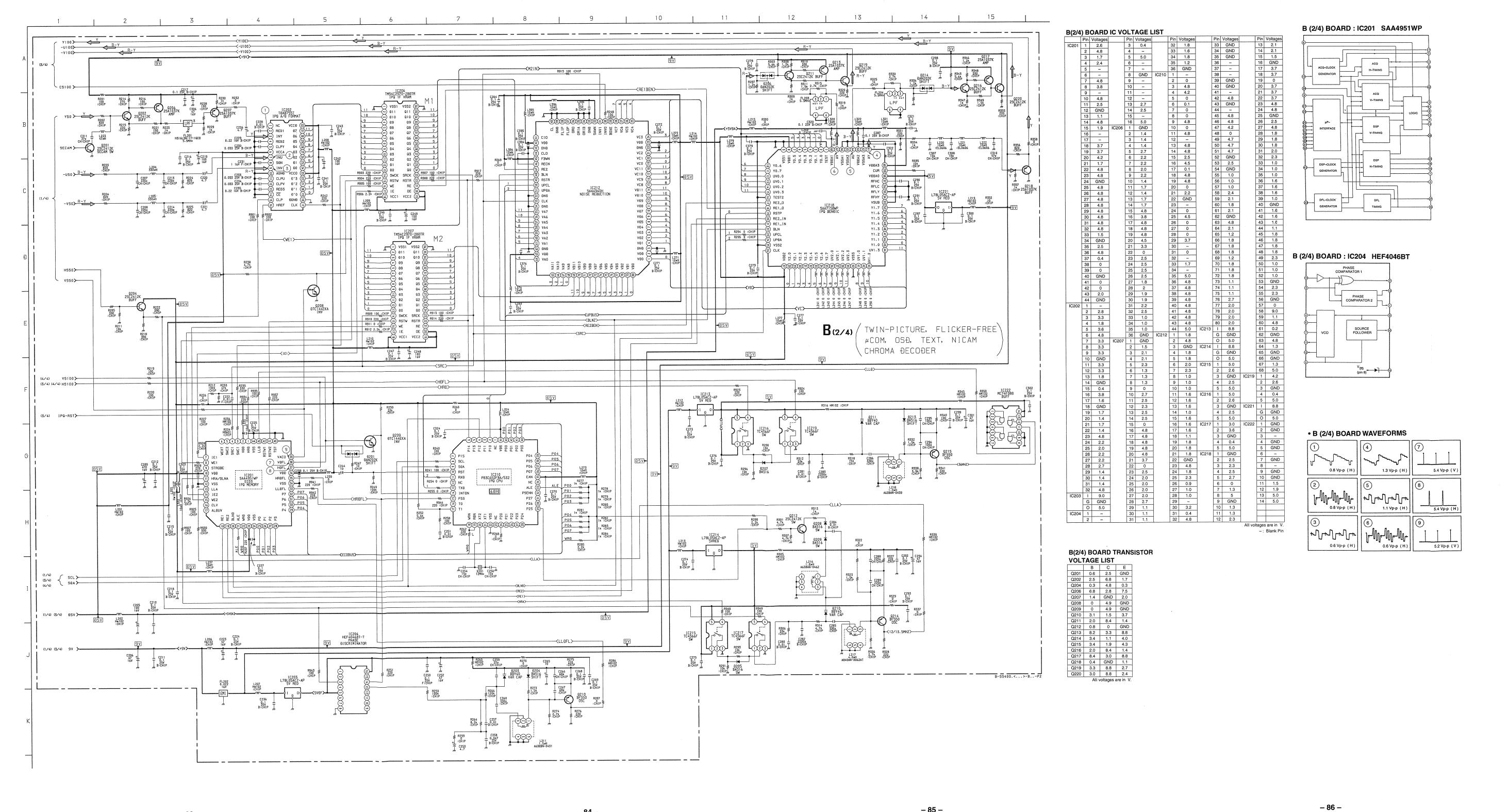
	Device	Printed symbol	Terminal name	Circuit
①	Transistor	T	Collector Base Emitter	
2	Transistor		Collector Base Emitter	J
3	Diode		Cathode Anode	• •
4	Diode	T	Cathode Anode (NC)	<u>\$</u>
(5)	Diode		Cathode Anode (NC)	، آ
6	Diode	I	Common Anode Cathode	, , , , ,
7	Diode		Common Anode Cathode	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
8	Diode	1	Common Anode Anode	
9	Diode	<b>S24033</b>	Common Anode Anode	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
10	Diode	Т	Common Cathode Cathode	
11	Diode	and the same of th	Common Cathode Cathode	
12	Transistor (FET)		Drain Source Gate	00 00 00 00 00 00 00 00 00 00 00 00 00 0
13	Transistor (FET)	H	Drain Source Gate	so se
14)	Transistor (FET)	I	□ Source □ Drain □ Gate	
	Discusto oc	emiconductot		

(Chip semiconductors that are not actually used are included.)



Schematic diagrams ← B2 K HA HB HC board B (1/4) board ■

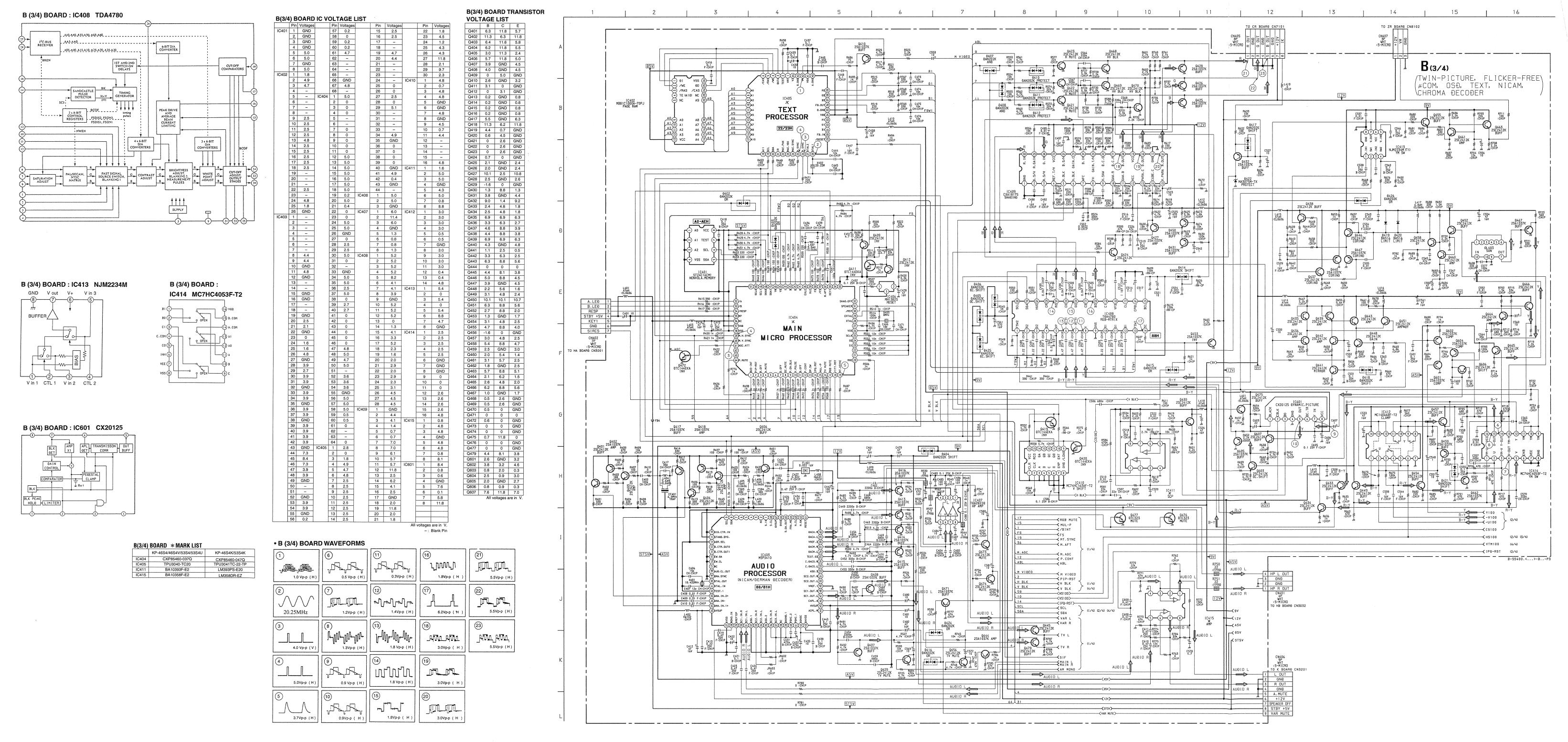




Schematic diagrams ← B (2/4) board B (3/4) board ■

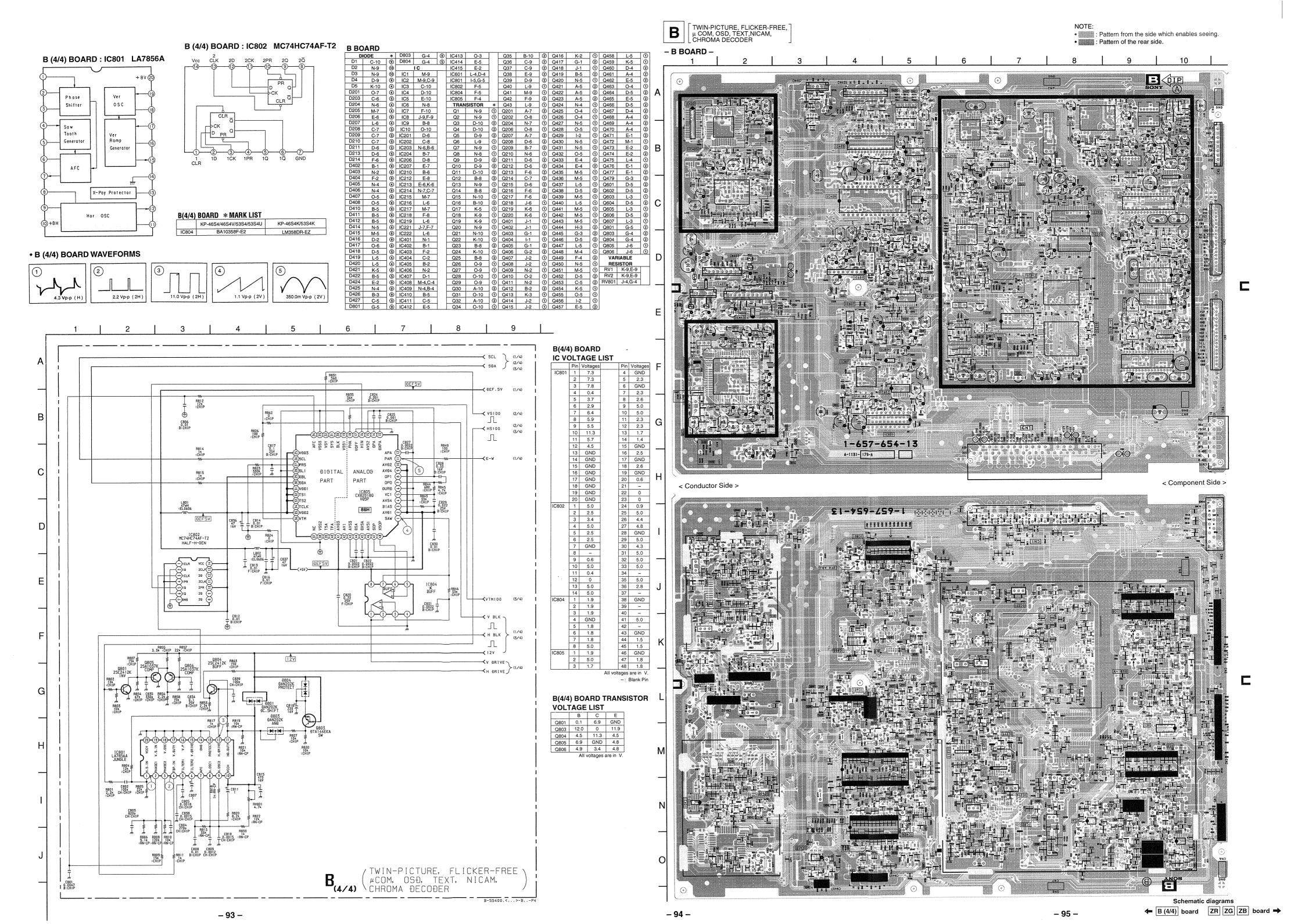
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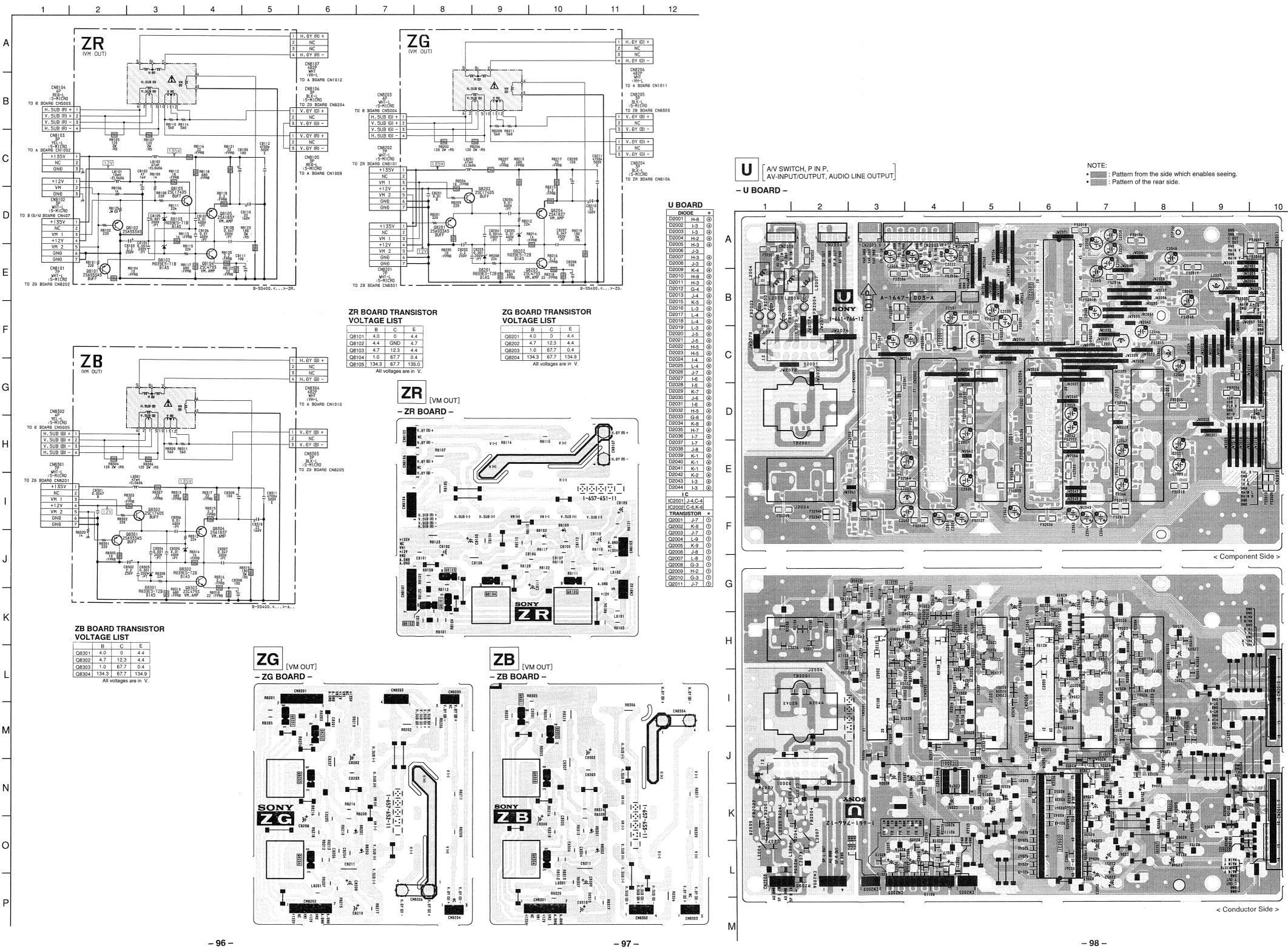
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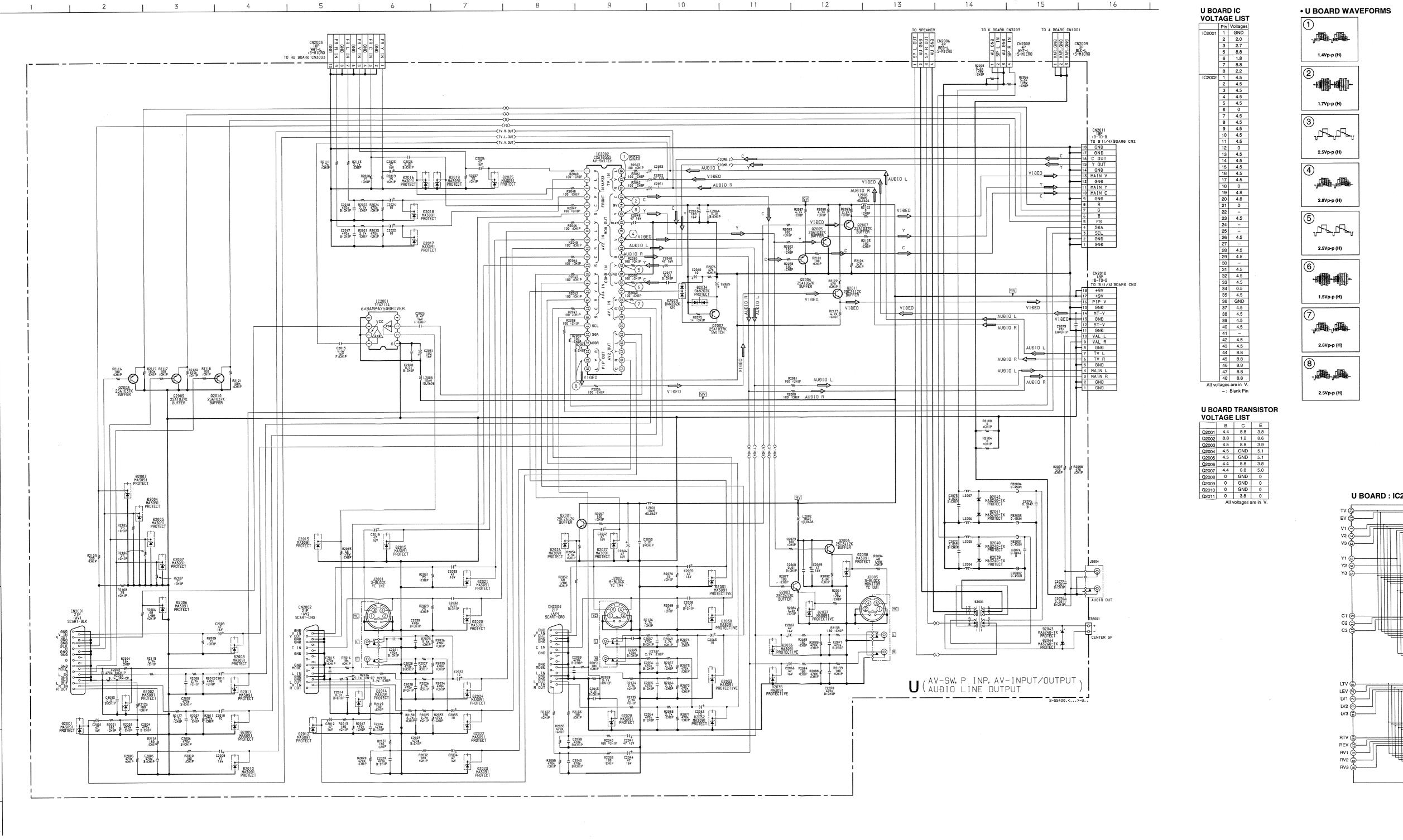
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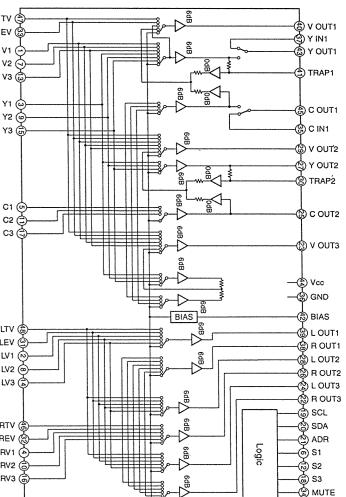
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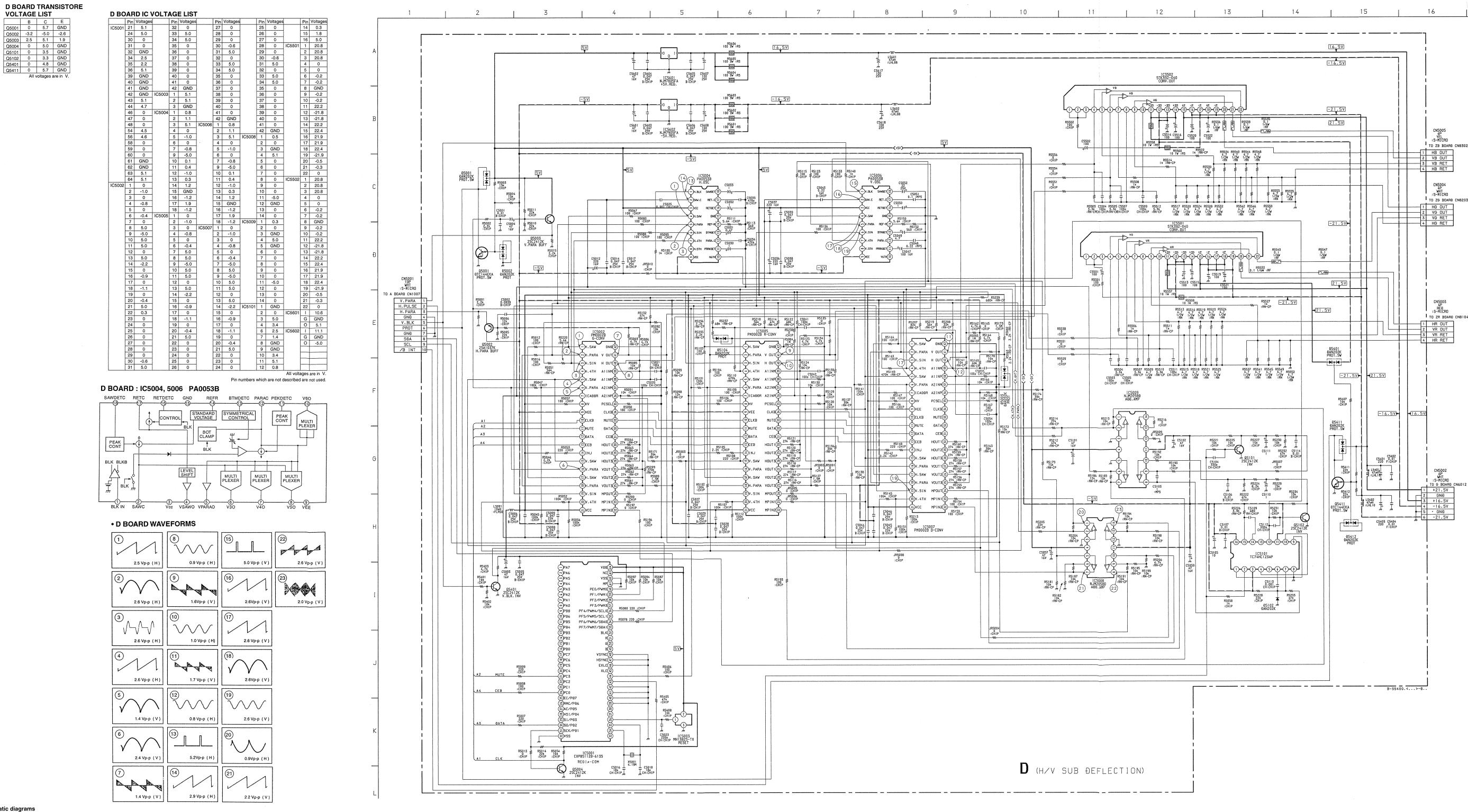


**- 100 -**

**– 101 –** 

U BOARD : IC2002 CXA1855S





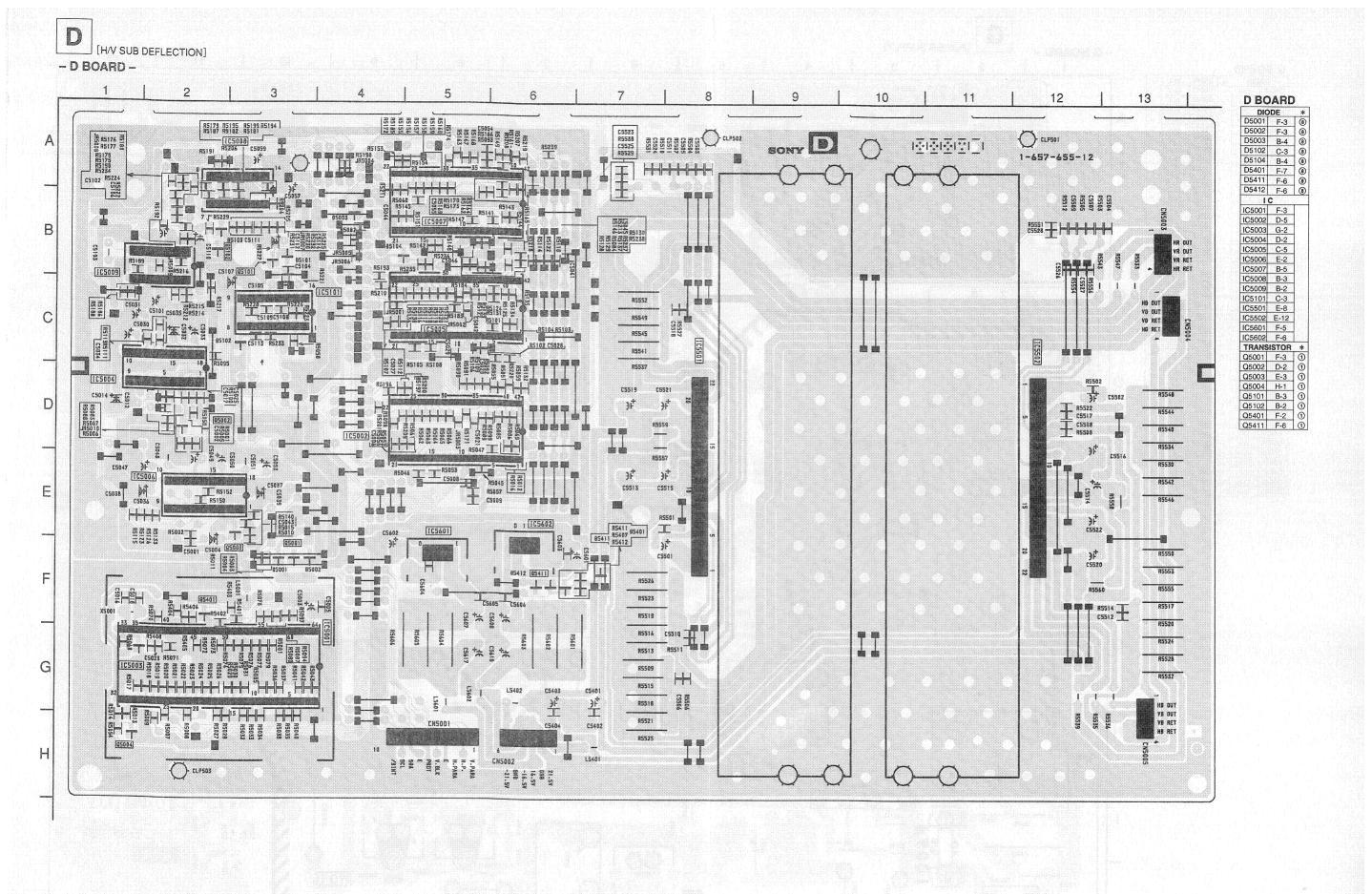
Schematic diagrams ◆ U board D board →

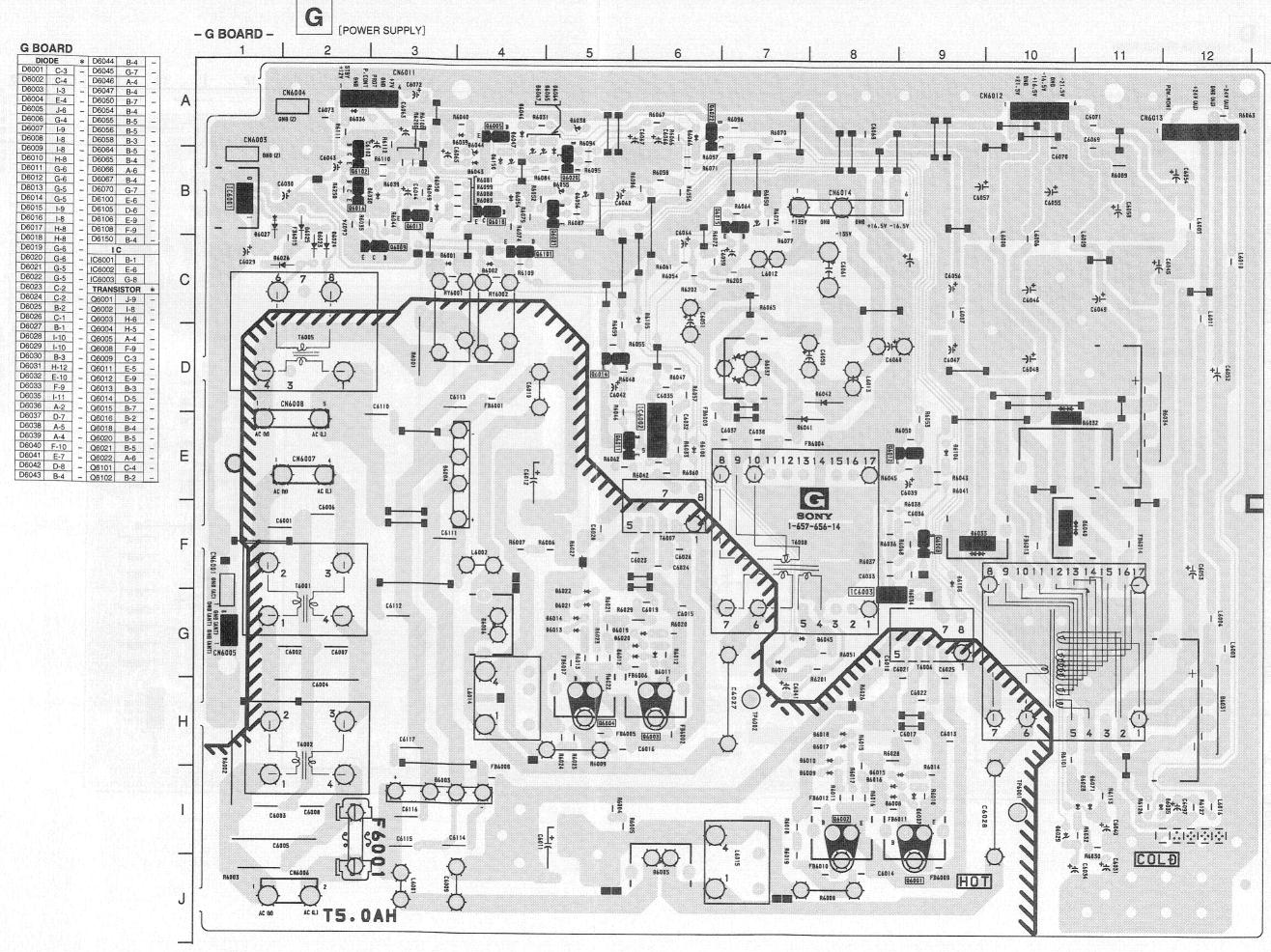
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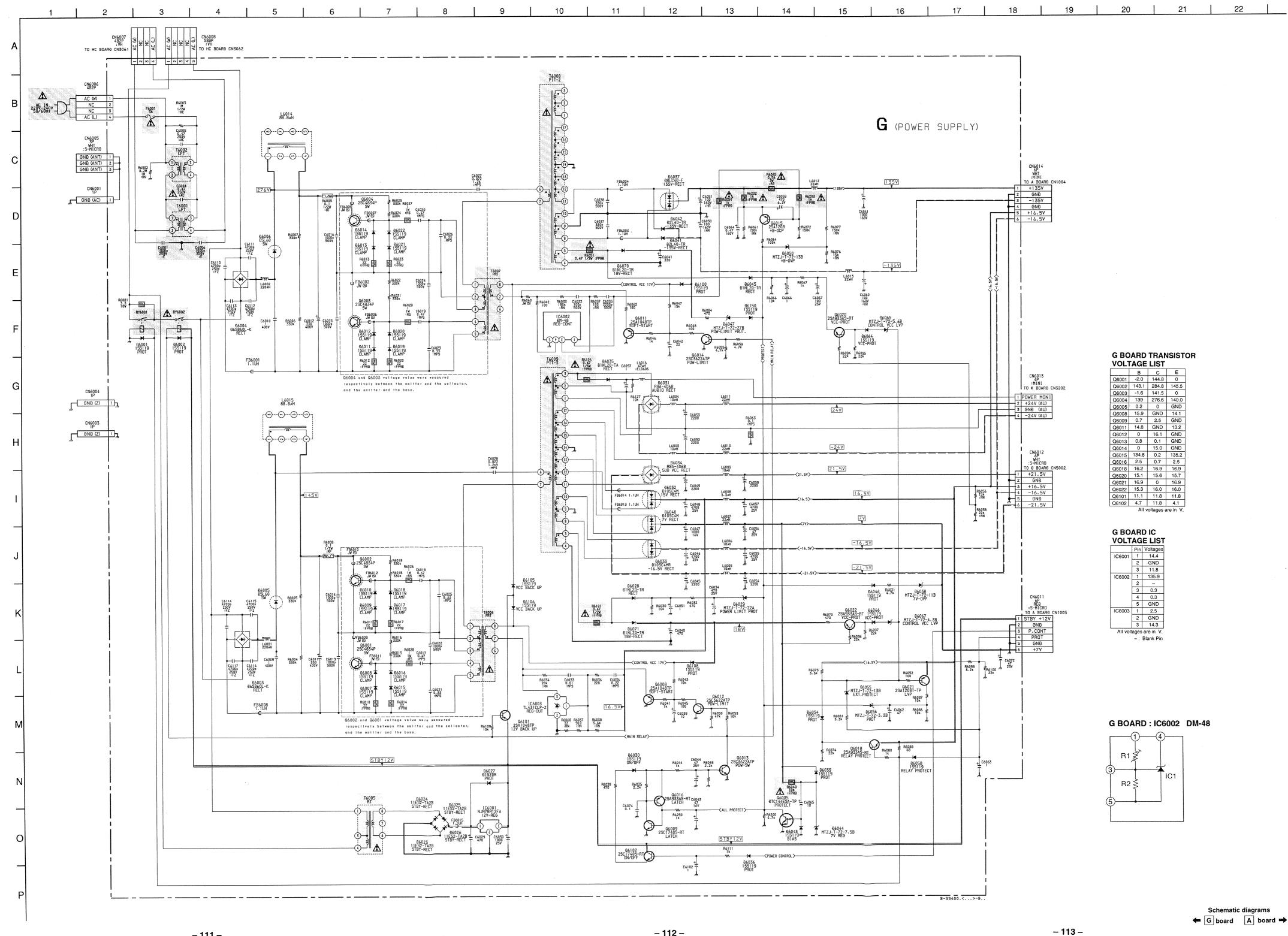
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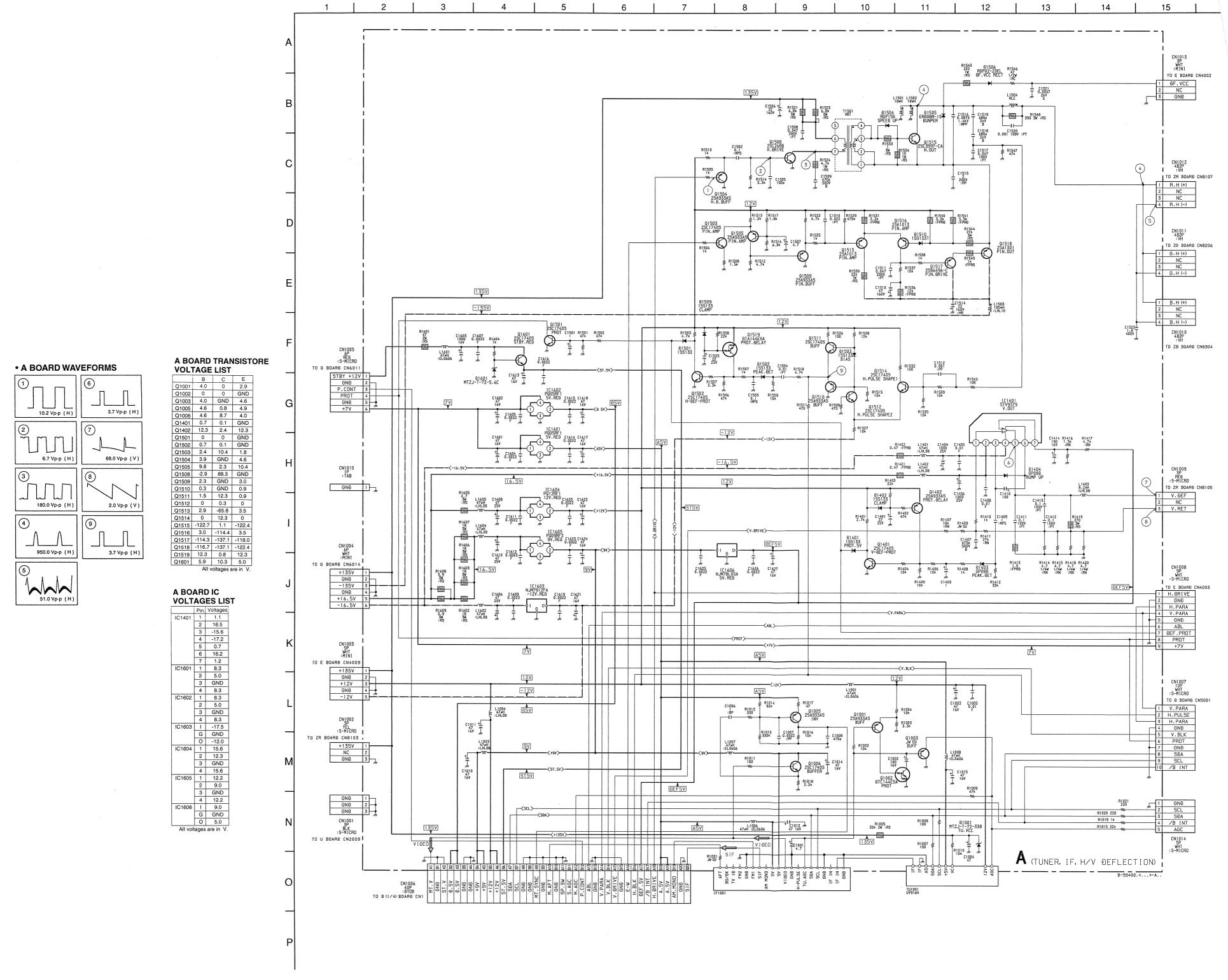
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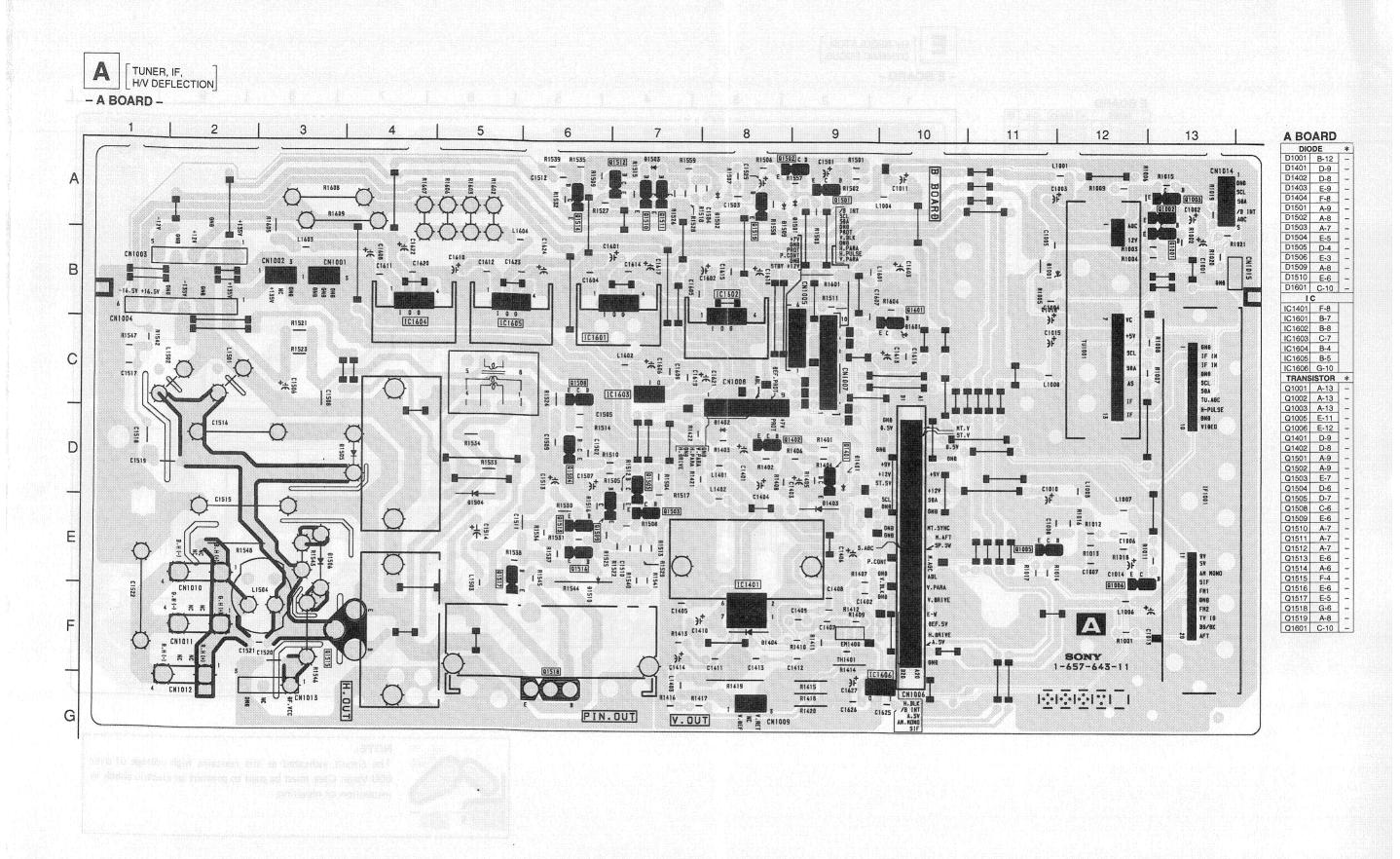
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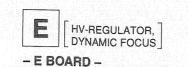


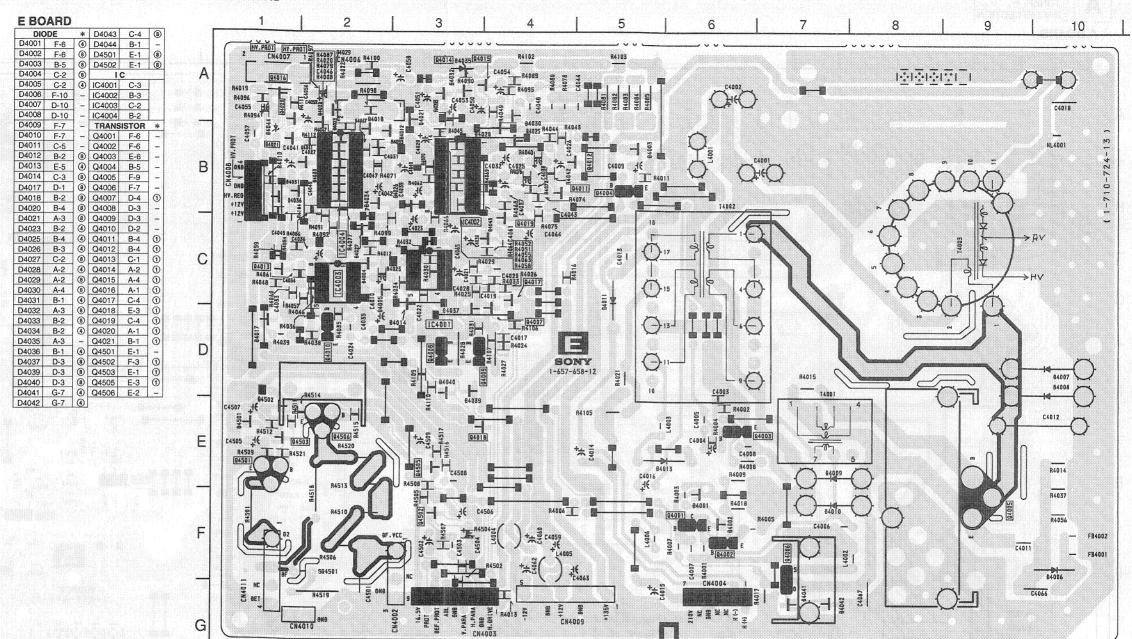


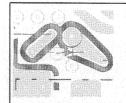






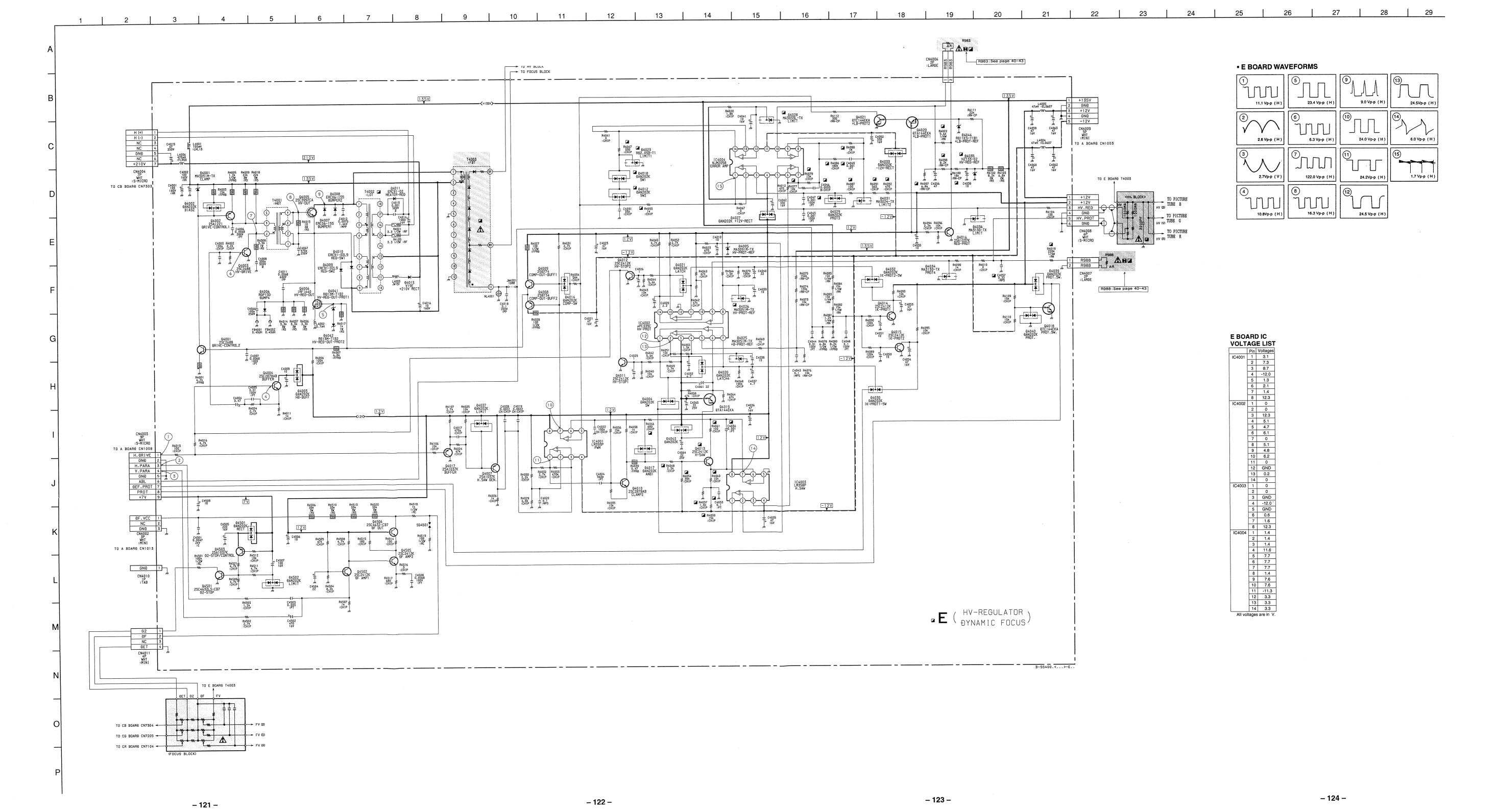


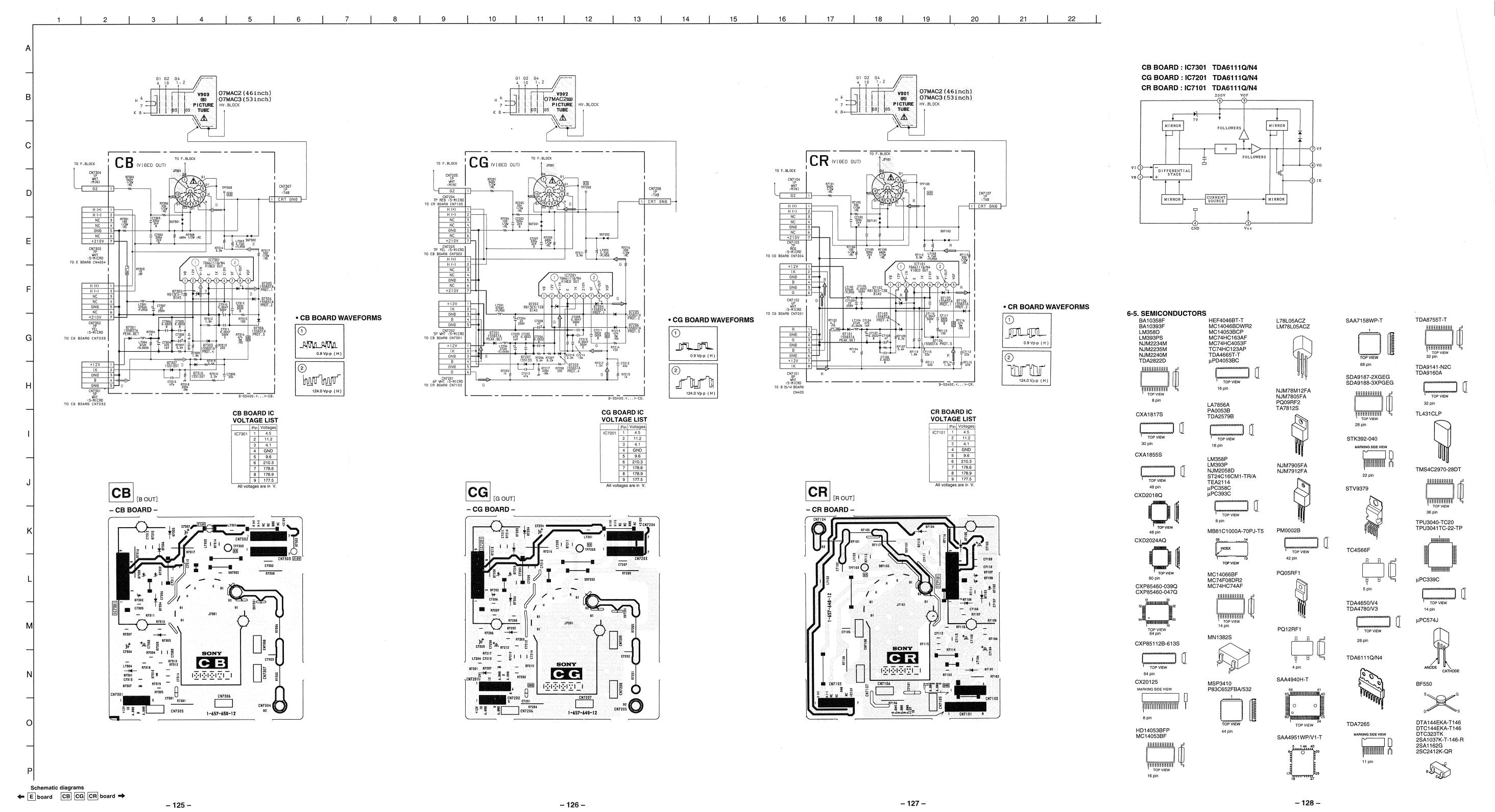




## NOTE:

The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.





## 6-5. SEMICONDUCTORS

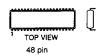
BA10358F BA10393F LM358D LM393PS NJM2234M NJM2235M NJM2240M TDA2822D



CXA1817S



CXA1855S



CXD2018Q



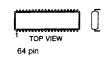
CXD2024AQ



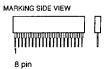
CXP85460-039Q CXP85460-047Q



CXP85112B-613S



CX20125



HD14053BFP MC14053BF



HEF4046BT-T MC14046BDWR2 MC14053BCP MC74HC163AF MC74HC4053F TC74HC123AP TDA4665T-T µPD4053BC



LA7856A PA0053B TDA2579B



LM358P LM393P NJM2058D ST24C16CM1-TR/A ΤΕΑ2114 μPC358C μPC393C



MB81C1000A-70PJ-T5



MC14066BF MC74F08DR2 MC74HC74AF



MN1382S



MSP3410 P83C652FBA/532



L78L05ACZ LM78L05ACZ



NJM78M12FA NJM7805FA PQ09RF2 TA7812S



NJM7905FA NJM7912FA



PM0002B



PQ05RF1



PQ12RF1



SAA4940H-T



SAA4951WP/V1-T



SAA7158WP-T



SDA9187-2XGEG SDA9188-3XPGEG



STK392-040



STV9379



TC4S66F



TDA4650/V4 TDA4780/V3



TDA6111Q/N4



TDA7265



TDA8755T-T



TDA9141-N2C TDA9160A



TL431CLP



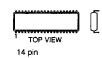
TMS4C2970-28DT



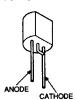
TPU3040-TC20 TPU3041TC-22-TP



μРС339С



μPC574J



BF550



DTA144EKA-T146 DTC144EKA-T146 DTC323TK 2SA1037K-T-146-R 2SA1162G 2SC2412K-QR



DTA144ESA DTC144ESA-TP 2SC1740S-R 2SC3622A-LK



IRFI640 2SA1837 2SC4793



2SA1013-O 2SA1208 2SA1208S-TP



2SA1048-YGR 2SA1175-HFE 2SC2785-HFE



2SA1221-L 2SA1221-T-M 2SB733-34 2SB734-T-4 2SD774-34



2SA1301-O



2SA933AS-QRT 2SC2878-AB



2SB649A 2SC2688-LK



2SC1740S-R



2SC3997CA

MARKING SIDE VIEW



2SC4632LS-CB7



2SC4834P



BAS16 BBY40



DAN202K



DAP202K



D1NL20 EGP20G GP08 GP08DPKG23 HZT33-02 MTZ-T-72-22A MTZ-T-72-33D RD2.0SB-T1 RGP02-20EL-6394 RGP15GPKG23 **1SS83** 



D1N20R MTZJ-11B MTZJ-4.3B MTZJ-5.6B MTZJ-5.6C MTZJ-T-72-13B MTZJ-T-72-3.3B MTZJ-T-72-3.3B MTZJ-T-72-5.6B MTZJ-T-72-7.5B RD11ES-B1 RD13ES-B2 RD22ES-B1 RD27ES-B2 RD33ES-B2 RD39ES-B2 RD4.3ES-B2 RD5.6ES-B2 1SS119-25TG 1SS133 11ES2



D10SC4MR



D10SC4M D8LC40



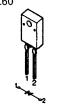
D6SB60L-K **RBA-406B** 



D2L40F D2L40-TA



D5L60



ERC06-15S ERC91-02 S2LA20F



ERC38-06 V19E



ERD08M-15



MA3024-TX MA3033-L MA3047-TX MA3051M MA3056M MA3075M-TX MA3091 MA3130 RD13M-B2 RD4.7M-B2 RD5.1M-B2 RD5.6M-B2 RD7.5M-B2



MA3091M-TX



MA3240-TX



SC802-06



**TLR124** 



Ne les remplacer que par une 7-1. COVER (KP-46S4/46S4K/46S4U) piece portant le numero specifie. **•** : 7-685-648-79 +BVTP 3X12 **1**: 7-685-663-79 +BVTP 4X16 (5)(30)(12)(26) (8)(8)(18)

7-2. COVER (KP-53S4/53S4K/53S4U) : 7-685-648-79 +BVTP 3X12 : 7-685-663-79 **+BVTP 4X16** ▼: 7-685-248-14 +KTP 3X12 (81 <u>56</u> <del>5</del>7 <u>55</u> (51) 80 <u>52</u> **(59**) 54 <u>52</u> (73)63)د (58) 76) (64)(52)**§** 52 <del>78</del>) 6561 68 8 67 58 66 69 (60)

7-3. CHASSIS

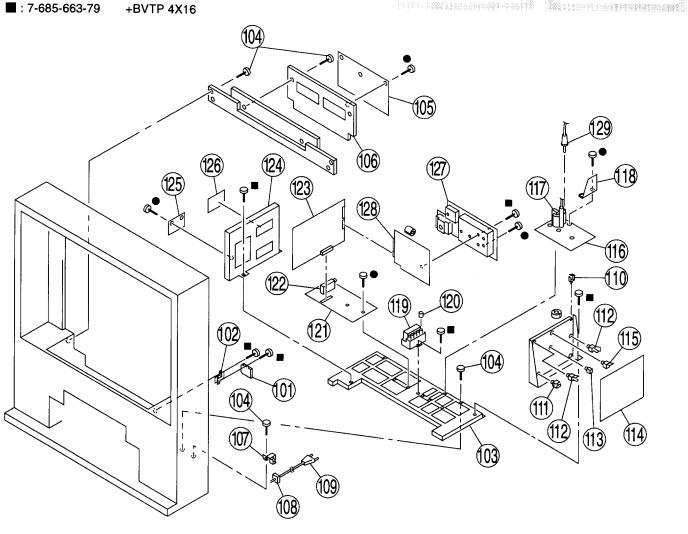
• : 7-685-648-79 +BVTP 3X12

The componants identified by shading and mark! are critical for safety.

Replace only with part number.

Replace only with part number specified.

Les composants identifies par une trame et une marque ! sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.



## 7-4. PICTURE TUBE

♦ : 7-685-663-71 +BVTP 4X16

The componants identified by shading and mark  $\triangle$  are critical for safety.

Replace only with part number specified.

Les composants identifies par une trame et une marque  $\hat{\Lambda}$  sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

